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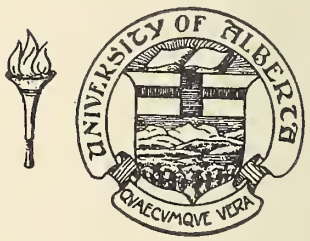

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THE UNIVERSITY OF ALBERTA

# A STUDY OF THE MENTAL GROWTH OF THE PRE-SCHOOL CHILD

A DISSERTATION
SUBMITTED TO THE GRADUATE FACULTY
IN CANDIDACY FOR THE DEGREE OF
MASTER OF ARTS

DEPARTMENT OF PHILOSOPHY
PSYCHOLOGY AND EDUCATION

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# A LABORATORY REPORT BASED ON THE DEVELOPMENTAL SCHEDULES OUTLINED IN "THE MENTAL GROWTH OF THE PRE-SCHOOL CHILD" BY GESELL

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CHAPTER I

# INTRODUCTION

The mental growth of the child has been the subject of much investigation during recent years. "The problem of finding out the nature and rate of mental development in pre-school children has been made much easier in the last few years, by the establishment of various standardized test situations and the classification of normative behavior. Moreover, the scientific study of child behavior, which the making of these tests necessitates, has added greatly to our knowledge of pre-school mental development. Among such behavior scales and mental tests for pre-school children the more important to date are the Stanford and the Khulman-Binet tests, Gesell's developmental schedules, Stutsman's performance tests, and Wallin's, Baldwin's, Goodenough's, Bayley's, and Hallowell's Tests." (1)

This study on the mental growth of the pre-school child is based on the developmental schedules which are outlined in "The Mental Growth of the Pre-School Child" by Gesell. The aims in undertaking such a study were: first, to become acquainted with the nature of the mental development of children between the ages of four months and five years; secondly, to gain a knowledge of Gesell's developmental items, the materials and apparatus which he used; thirdly; to determine whether such schedules could be used by the relatively inexperienced psychologist; and fourthly, to discover whether the results of

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(1) Bridges - Social and Emotional Development of the Pre-School Child - page 1.

testing a few cases would have the same general trend as those of Gesell in his investigation. This report does not include a discussion of the theoretical nature of the problems.

Gesell accepts behavior as the functional index of developmental maturity. The study of mental growth then resolves itself into a study of patterns of behavior. Such patterns follow in orderly genetic sequence. There is, however, no sharp break between the behavior of one age and that of the age directly preceding or following it. The child of four months seems just about to do what the six months is able to do. "Development may be defined as the succession of steps by which any living being has acquired the morphological and dynamic characters which distinguish it." (1)

Gesell expresses "the ideal course of mental development by a series of mental or developmental ages which vary directly and proportionately with duration as expressed by chronological age." (2) For example, the twelve months old child has a developmental age of twelve months, the five year old of five years.

Development during early infancy is much more rapid than during the later pre-school period - a fact which is of considerable significance. One month retardation before the first year may indicate a whole year of retardation after the second birthday.

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(1) Gesell - "The Mental Growth of the Pre-School Child" Page 24.
(2) " - same - Page 19.

## Brief Historical Sketch of Several Methods Used in Child Psychology.

It is only in the modern period that the child has been accepted as a subject for scientific study. Buhler states that the modern study of the child is of German origin, starting about the middle of the nineteenth century.

The observational biographical method was one of the oldest and most widely used. The child was observed from day to day and his behavior noted in minute detail. Most of the material, however, was of little use practically as its character was individual and personal and left too much for the reader to interpret. There was no attempt to standardize any of the results - much of the observation of a single writer being confined to one child. A few of the names which are associated with this type of psychology are Tiedeman who published the first account of children's early mental development in 1787, Preyer published "The Mind of the Child" in 1882, Miss Shinn wrote "The Biography of a Baby" in 1893. Others are Moore, Major, the Sterns, the Scupins, and Dearborn.

The questionnaire method played a major part in the development of the child study movement in Boston about 1890. Stanley Hall, at this time, started to study the contents of children's minds. Many questionnaires followed, resulting in much material about children, particularily of school ages.

The method of experiment in child psychology dates chiefly from the work of Thorndike and Watson. The latter made experimental studies of hereditary responses and emotional

reactions during the first six months of life. Krasnogorski applied the method of the conditioned reflex to normal infants in 1907. Mateer in 1918 also used this method.

The fourth method to be mentioned is the psychometric method. The procedure involves the application of standardized experimental situations to a large number of children. The results are scored and treated statistically. Generalized statements based on observations of a number of cases are made. Binet was the first to use this method in establishing a scale to measure intelligence. Terman and Khulman in U.S. revised Binet's scale. Many other investigations, too numerous to mention, following this procedure have been made during the last few years.

The case-history or clinical method has been used for many years, even before biographical studies were made. Descriptions of cases of defective, abnormal, unusual, or diseased children can be found in medical literature.

## CHAPTER II

## GESELL'S INVESTIGATION

Gesell, in his investigation, attempted a systematic survey of the ordinary and normal behavior of infancy and early childhood. He began his study in 1919 when normal infants were brought into the Yale Psycho-Clinic for observation. In 1920 a special study of two year old children was made. Three, four, and five year olds and the younger groups were added later. At each level the children were within two weeks of their chronological age.

The method used was that of the clinical and natural history type. The psychological examination of the child was followed by an analytic interview with the parent. Most of the subjects were interviewed in the home. Those under two years were seen both at home and at the clinic but always in the presence of the mother and under natural circumstances.

Fifty normal children were examined at 4, 6, 9, 12, 18, 24, 36, 48, and 60 months of age making a total of four hundred and fifty. The number of boys and girls in each group was similar. Preference was given to those who came from middle class homes. Definitely feeble-minded and markedly retarded children were excluded from the normative series.

The results of these observations were assembled into developmental schedules which include all items of normative and descriptive value in a given age group and which have a significance in respect to developmental status. There are in all one hundred and fifty normative items. A detailed des-

cription of these is given in "The Mental Growth of the Pre-School Child" - Gesell - pages 68 - 158.

It was found upon examination of the results of the investigation that behavior divided itself naturally into four fields, namely, motor, language, adaptive, and personal-social behavior.

Motor behavior includes items related to muscular capacity and co-ordination. This field can be subdivided into postural control, locomotion, prehension, drawing, and hand control. Language includes vocalization, speech, and auditory comprehension. The sub-divisions are vocabulary, word comprehension, conversation, and reproduction. The personal-social group contains items relating to social experience and personality. It can be sub-divided into, reaction to persons, personal habits, reactions showing initiative and independence, play response, and acquired information. The adaptive group includes the general capacity to exploit the environment or to make adjustments to imposed situations. Eye - hand co-ordination, imitation, recovery of objects, comprehension, discriminative performance, appreception and completion, and number concept are the sub-divisions in this field. The items of behavior of the above groups and their ratings will be found in Chapter IV of this report.

Gesell used the initial letters M, L, A, P, to indicate the general fields of behavior:

M - Motor; L - Language; A. - Adaptive; and
P - Personal-social behavior.

Each item is numbered, The first digit indicates the sub-

division in the general field, the second digit indicates the specific item in the sub-division. For example, M 15; M - motor behavior; 1 - the first sub-division, postural control; 5 - the fifth item in the sub-division postural control; which is "stands with help."

Ratings assigned to each item are given month letter values.

A+ represents a frequency of 1 to 19% of children of that age level; A, a frequency of 20 to 49%; B+, 50 to 64%; B, 65 to 84%; C, 85 to 100%.

Numbers represent the age in months. For example, a 4 C rating means that 85% to 100% of children of four months of age act in this manner. A line under the rating indicates that a child failed to behave this way. Thus 6A (2) indicates that this child failed to behave in a certain manner. Also, that 20 to 49% of six months old children do pass this item whatever that may be.

This same method of rating and of designating fields of behavior and their respective items is used in the present study.

## Psychological Materials and Apparatus.

The following is the set of materials and psychological apparatus used by Gesell. Developmental schedules for each are also included. (1)

1. White enamel saucer, diameter 15 cm.
2. White enamel cup with handle, 9.5 cm. in diameter at top,,

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(1) See list of Tables for the pages.
(2) In Gesell's book, a circle is used instead of a line.

3. Teaspoon, standard size, aluminum.
4. Ten wooden cubes, 2.5 cm. square, painted bright red.
5. Pencil, standard size, full length.
6. Small nickel bell, wooden handle of type used in kindergartens.
7. Wooden embroidery ring, diameter outer edge 11 cm., painted bright red. Piece of white string 25 cm. in length attached.
8. Several sheets of paper, letter size and half letter size.
9. Wooden rod, length 10 cm., diameter 1 cm., painted bright red.
10. Red lumber crayon, Faber.
11. White sugar pellets (Admiralo, Gardiner Lenas Co.) Flat on one side, convex on other, diameter 8 mm.
12. Small rubber ball painted in bright colors.
13. Glass bottle, 7 cm., diameter of opening 1.2 cm.
14. Rubber doll, small, whistle at back, height 12 cm.
15. Form board.
16. Performance box.
17. Eight white cards 8 x 5 in. with following figures outlined in black, center of card:

    Card 1. Circle, diameter 8 cm.

    Card 2. Cross; lines at rectangles. Length of lines 7.5 cm.

    Card 3. Cross; lines oblique. Length of lines 7.5 cm.

    Card 4. 7 cm. square.

    Card 5. Equilateral triangle, 9.5 cm.

    Card 6. Diamond, length of sides 5.5 cm.

    Card 7. Hexagon, length of sides 5.5 cm. sides parallel to long side of card 5 cm. apart.

Card 8. Rectangle, 10 x 6.5 cm., with the two diagonals and lines drawn perpendicular to centres of sides.

18. White card $5\frac{3}{4}$ x $5\frac{1}{4}$ in. divided by black lines into four equal rectangles.

Drawing of cup, shoe, dog and house in rectangles.

19. White card $5\frac{3}{4}$ x $5\frac{1}{4}$ in. divided as above into six equal rectangles. Drawings of flag, star, basket, clock, leaf, book.

20. White card 8 x 5 in., six circular drawings symmetrically placed, representing stages in drawing of watch.

21. Two gray cards each 14 x $5\frac{1}{2}$ in. (Smaller size of $4\frac{1}{4}$ in. x 11 in. may be substituted.) Cards properly placed make picture of little girl knitting.

21a. Same cards bisected.

22. Puzzle box.

23. Ten brightly colored cardboard forms, and four sheets of cardboard on which is indicated by lines where the forms should be placed. Corresponding to these outlines are ten brightly colored cardboard forms.

24. Card 8 x 5 in., picture of domestic scene.

24a. Same picture card, cut diagonally.

25. White card 8 x 5 in. In centre of card a two-inch square is drawn, sub-divided into four one-inch squares, the whole square colored red with a crayon.

26. Fishing Test apparatus.

27. Paper sheet, half letter size, with incomplete drawing of man.

28. Three pairs of pictures - one humorous and one non-humorous in each pair - on cards 11 x $8\frac{1}{2}$ in.

28a. On green sheet half letter size, picture of boy seated blowing bubbles.

29. Free construction box.

30. Green sheet, letter size, with first three Porteus maze test reproduced on it (diamond, cross, garden maze.)

31. Picture of man on shying horse.

32. Picture of man fishing up shoe.

33. Maze 9 x 12 in. with fourteen blind alleys.

34. Five objects - door key for common lock, closed pocket knife, watch, penny, pencil.

35. Vocabulary list - first twelve words from each list.

36. White card with two black lines in center, one line $2\frac{1}{4}$ in. one $1\frac{3}{4}$ in.

37. Two black one-inch cubes, weighted. One weighs 3 grams, one 15 grams.

38. Card with four figures drawn on it - some feature on part of the body omitted from each figure.

39. Card with ten geometric forms drawn on it. Same forms, drawn individually on ten small cards.

40. Two cardboard rectangles 3 x 2 in. One rectangle is bisected diagonally.

41. Picture card Dutch scene.

42. Card with four bright-colored rectangles symmetrically placed. First rectangle colored red, second yellow, third blue, and fourth green.

43. Card showing three pairs of women's faces, one of each pair of faces pretty, the other ugly.

## CHAPTER III

## THE WRITER'S INVESTIGATION

In the present study the psychological materials and apparatus which Gesell used were also used. Much of it was bought directly from Stoelting & Co., to be certain that the materials were identical. There was one change made, however. On account of the expense, the form board was not purchased, and a Healy and Ferdinald Construction B form board was substituted. This means that as far as checking the results obtained with Gesell's in using this piece of apparatus, the behavior will be unreliable. But the principle is the same and the item is still of value in studying the development of discriminative performance. The developmental schedules as listed in "The Mental Growth of the Pre-School Age" - Gesell - were used in the examinations. (1)

The Kiwanis Home and the Edmonton Creche Society co-operated in allowing children in their care to be observed. There are also a few outside cases included. In all fifty-four children were studied.

| Number of Cases | Age |
|---|---|
| 7 | 5 years |
| 8 | 4 " |
| 8 | 3 " |
| 9 | 2 " |
| 5 | 18 months |
| 7 | 12 " |
| 6 | 9 " |
| 3 | 6 " |
| 1 | 4 " |
| TOTAL 54 | |

In addition to the above cases, twelve retests were made,

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(1) See Gesell "The Mental Growth of the Pre-School Child" Page 367 - 75.

making a total of 66 tests. With the exception of eight, these children came from inferior homes or homes of a low economic status. This fact no doubt has some influence upon the results obtained. Also, with the exception of the same eight they were examined without their mothers. As these children were quite used to being alone, and the majority showed few or no signs of shyness, it was felt that this fact had little influence if any, upon the way they behaved. In practically all cases the children were anxious and pleased to have the examiner "play with them."

A few of the subjects were reobserved after an interval of three months. The purpose of this second observation was to discover if, at certain ages, an interval of three months is sufficient to notice any appreciable growth in behavior.

The child and the examiner were seated at a low table in a room by themselves. The tests were presented in the order indicated on the developmental schedule for each age. Results were recorded during the observation period. Due to the absence of the mother, as much information could not be secured about certain items of behavior as was desired. This was unavoidable.

## CHAPTER IV

### SYLLABUS OF NORMATIVE ITEMS

Gesell arranged a syllabus of normative items which is helpful as a table of reference. It is not in any way meant to be applied in observing. The order for actual application is given in the developmental schedules. This syllabus is as follows. (1)

(M) Motor

M1. Postural Control

10. Resists head pressure 4C

11. Holds head erect 4B 6C

12. Lifts head prone 4C head on chest 4B 6C

13. Back resistant 4C

14. Tries to sit 4C Sits with support 4A+ slight 6B+ alone 6A+ 9C

15. Stands with help 9A 12C alone 12A 18C

M2. Locomotion

20. Reaction when prone: crawling 4C creeps or hitches 6A 9B 12C can climb stairs 12B+ 18C

21. Rolls side to back 4C

22. Rolls back to stomach 4A+ 6B

23. Motor reaction in bath: kicks 4C+ splashes with hands 4A 6C

24. Pushes with feet 4C

25. Makes stepping movements 9B

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(1) Taken from "The Mental Growth of the Pre-School Child" Gesell - Pages 61 - 67.

26. Walks with help 9A+ 12B alone 12A 18C

M3. Prehension

30. Resists rod withdrawal 4C

31. Clasps cube, 4C Thumb opposition partial 4C complete 4A 6C

32. Hand reacts to table 4B 6C picks up cube 4A+ 6B. Secures pellet: whole hand 6A fine prehension 6A+ 9B

33. Puts hand to mouth 4C inhibits 12B

34. Inhibits one hand 6A

Manipulates one hand 6A 9C

Preferential use one hand 6A+ 9B+ 12B

35. Holds two cubes 6B 9C drops one for third 6B+ 9B accepts third 9A 12B accepts fourth 18B

36. Releases objects: throws objects to floor 6A puts cube into cup (imitation) 12A throws ball into box 18B

M4 Drawing and Hand Control

40. Makes a scribble spontaneously 12A 18B imitatively 12B 9A+

41. Makes a stroke 18B

Differentiates stroke and scribble 18A

42. Imitates vertical 18A 24B 36C circle 24A 36C

Horizontal 24A+ 36B cross 24A+ 36B+

43. Copies circle 24A+ 36B 48C cross 36A 48B square 48A 60C triangle 48A+ 60B hexagon 60A

44. Copies diamond in ink 60A+

45. Aligns card 36B

46. Co-ordinated tracing: diamond 36A+ 48B cross 48B+ 60C

47.

47. Steadiness Fish test A 3=60B 48B B. 4=60B+

48. Draws a man 48A 60B

## (L) Language

### L1. Vocabulary

10. Vocalized 4B Says "mama", "dada," or equivalent syllables 6A+ 9B

11. Says one other word 9A two 9A+ three 12C four 12B five 12A+ 18B

12. Names one picture 18A two 18A+ five to seven 24B eight to nine 24A 36B

13. Names five familiar objects 24B+

14. Two or more words together 18A+ Speaks sentences 24B

15. Uses pronouns, plurals, past 24A+ 36B

16. Defines by use 48A 60A

17. Word Test Series. 3-8. 60B 8-12. 60A 96B

### L2. Word Comprehension

20. Adjusts to words 9B+

21. Points to one or two pictures 18A three or more 18A+ five to seven 24B seven plus 24B+

22. Obeys two prepositions 24B three 24B+ 36B four or five 24A+ 36A

23. Obeys four prepositions 48C 48B+

L3. Conversation

30. Names one object in picture 18A+
31. Names three objects in picture 24A 36C 4=36A
32. Uses one or more descriptive words 36A+ 48B
33. Describes picture 60A+
34. Interprets humor 60B 60B+
35. Tells what he had drawn 48B made 48B+
36. Gives differences 60A

L4. Reproduction

40. Repeats things said 12A+ 18A
41. Repeats 3 syllables 24A
42. Repeats 6 syllables 36C
43. Repeats 12 syllables 48B+
44. Repeats 4 digits 48B+ 60B
45. Repeats 5 digits 48A+ 60A
46. Non-infantile articulation 48A 60B

(A) Adaptive Behavior

A1. Eye-hand CO-Ordination

10. Moving persons 4C— Plate 4B
11. Winks at sound 4C— at hand 4B at pencil 4A+ 6B
12. Reacts to paper 4C defensive hand movement 4A
13. Regards spoon 4B+ cube 4A 6B pellet 6B+
14. Picks up spoon from table 4A+ 6C
15. Dangling ring: reacts 4C closes in 4A clasps 6B above head 6B+ pulls down 9B uses string 12B

16. Reaches for spoon 4A+ 6B 9C

A2. Imitation

20. Spoon in cup 9A 12B

21. Rings bell 9A 12B

22. Hits doll 12A 18B

23. Block building: piles two 12B 12B+ three 12A 18C four 18A 24B more 24A

24. Builds bridge 24A 36B

25. Builds gate: from model 48A 60B imitation 48B+

26. Recall block stairway 48A+ 60B+

27. Folds paper once 18A+ 24B twice 24A+ 36B+ diagonally 36A 48B

A3. Recovery of Objects

30. Fallen spoon: conscious of disappearance 6B looks for 6A 9C

31. Cup covered cube test: lifts inverted cup 9C secures cube 9A 12C

32. Unwraps cube 9A+ 12B+ 18C

33. Removes pellet from bottle 12 imitation 18

34. Removes ball from box 36B

35. Garden maze 60B

A4. Comprehension

40. Cube in cup. Commission 9A+ 12C

41. Cube in plate or cup 18B+ 12A+ cup, plate, box 18A 24A

42. Performs three commissions 36A 48B+ 60B

43. Comprehends IV "one" 36B two 36B+ 48A

44. Comprehends "lost" 48A 60B crosses street 48A 60B

45. Comprehends VI 48A+ 60B+

A5. Discriminative Performance

50. Puts rod in box 12B

51. Puts square in box 18A 24B

52. Form board: Circle 18B+ shown 18B adaptation 18A
Triangle 18A+ shown 18A
Solves three: no error 24B+ in one minute 24B 36C
Adapts three: no error 24A+ in one minute 24B+ 36B

53. Discriminates lines 36B

54. Aesthetic comparison 36A 48A 60B

55. Weights 36A 48B+ 60B

56. Selects humorous 48B 60C

57. Matches forms 4= 36B 7= 36A 48B

58. Four blocks design 36A 48B

A6. Apperception and Completion

60. Names watch: 4th, 18A+ 24B 3d, 24A 36B+ 2d, 24A+ 36B+

61. Solves picture completion 24A+ 36B

62. Solves picture adaptation 24A+ 36A

63. Form completion A (2 of 5) 36A 48B, (3 of 5) 48B+ (4 of 5) 48A; Form completion B 3= 60C; 4-5= 60B; 6= 60B+; 7= 60A; 8= 60A+

64. Patience picture completion 48B

65. Patience card 48A 60B

66. Names incomplete man 48B

67. Man completion 3= 48B 5= 48A

68. Missing parts 48A+ 60B+

A7. Number Concept

70. Puts in "just one" 24A 36B; two 36B+ 48B; three 48A+

71. Counts four 36A 48B+; ten 48A; thirteen 48A+ 60A

72. Draws one 48C two 48B three or four 48A+ 60B+

73. Problems: a) 48A b) 48A+

74. Number of fingers 60B+

(P) Personal and Social Behavior

P1. Reaction to Persons

10. Adapts to nursing 4C

11. Selective attention to face 4B expresses recognition 6B of strangers 6B+ 9C

12. Anticipatory motor adjustment 4C

13. Reacts to mirror images 6A 9B 12C

14. Salutations: Waves"bye-bye" 9B+ Says "Bye-bye" or "Hello" 9A+ says "thank you" 18B

15. Shows affection 18A 24B

16. Forbidden Acts; Inhibits acts when forbidden 12B habitually 18B

17. Tells experiences 24B tells stories 36B

P2. Personal Habits

20. Puts on shoes; Tries 12B succeeds 24A laces 48B ties 60A
21. Uses spoon 12A well 18B, 24C uses knife 48B+
22. Bowel control 12A 18B asks to go 18A 24C
23. Bladder control 12A+ 18A 24B
24. Buttons clothes 48B
25. Washes self 36A, 48B, 60B brushes teeth 48B
26. Orderliness: Puts away toys 36B orderliness in box 60B

P3. Initiative and Independence.

30. Asks for things at table: pointing 12A 18C by name 18A 24B
31. Persistence in reaching 6A 9B
32. Knows where he wants to go 18B
33. Tries to turn knob 18B 24C opens door 36B
34. Climbs for objects 18A moves chair to attain end 24C
35. Goes on simple errands 18B+ outside 36A 48B
36. Trusted with breakables 36B
37. Resists suggestion 48B 4 times 60A 3 times 60B
38. Crosses street alone 36B+

P4. Play Response

40. Enjoys bath 4C laughs aloud 4B frolics when played with 6B+

41. Plays with hands 4C scratches 4B with objects 4B+ pats table 6B 9C bangs spoon 6B casts objects for noise 6A 12C exploits paper 6B 6A 9B puts cube in cup 9A+ 12A

42. Reacts to music 4C turns head to voice 4C to bell 4B+ 6B coos 6A, 9B+, 12B smiling, laughing 6B+ dances 9B requests tunes 24B recognition 36B

43. Plays pat-a-cake or peek 9B+ 12C with mirror image 9A 12B

44. Looks at pictures 18B+ likes stories with pictures 18A 24B 36C

45. Dramatic play: imitative 18A 24B pretence 36B constructive 48C

46. Dramatic drawing 48A 60B

47. Constructive play: Plays with cup, spoon, plate 6B 6A 9B 12C Uses building material constructively 48B 48A 60B

P4. Acquired Information

50. Asks questions of elders 36B

51. Points to parts of body 18B two 18A 24B distinguishes right and left 60B+

52. Verbal facility: counting 18A+ repeats part of alphabet 18A+ recognition of letters or rhymes 36A

53. Tells name 24B full 24A sex 24A 36B+ age 60B

54. Knows money is for purchase 48C names coins 48A+ 60A

55. Distinguishes forenoon and afternoon 60B+

56. Uses color names 24A names one color 24A+ 36B+ two colors 48B+ four colors 48A 60B

# CHAPTER V

## MENTAL DEVELOPMENT AT 4, 6, 9, and 12 MONTHS

Growth, mentally and physically, progresses most rapidly during the first year. The person who sees the child at stated intervals only during this period particularily notices marked advance. He changes from a very tiny being who lies where he is placed at a few weeks of age to a much larger individual who is very alert, able to sit alone, creep, and in many cases walk, who can say a few words, and is interested in his surroundings at twelve months of age.

Unfortunately, it was difficult to find children at four, six, nine, and eighteen months, hence, there are too few cases at these levels. However, those which were observed were of value in assisting to develop technique, in becoming acquainted with the items used by Gesell, and in comparing the behavior at these age levels with that of other levels.

### Motor Development at Four Months

At four months the infant is already beginning to develop postural control, behavior of the locomotive type, and ability to grasp.

#### Postural Control

At this level 85% to 100% of children resist head pressure. (1) Ability to hold the head erect, and to lift the head

(1) Percentages quoted from here on are those of Gesell.

and chest when placed in a prone position is displayed by 65% to 84% of children. Practically all babies show a certain amount of postural tone which keeps their back somewhat rigid while being examined. Only 1% to 20% make any effort to sit up.

One case was observed in the present study. This child, case D.L., seemed well developed from the viewpoint of postural control. She scored on every item mentioned above.

Locomotion

At four months practically all children have developed to the point of being able to kick their feet in the bath. Also, if held up so that the subject's feet are just touching the examiner's lap, there is a definite upward pushing reaction. Some kind of squirming, wriggling progression is noticeable at this age, in the majority of cases, when the infant is placed in a prone position. Case D.L. manifested such behavior.

Prehension

Four months children exhibit one other type of motor behavior, that is, prehension or the ability to grasp. Ability to grasp a rod is displayed by 85% to 100% of babies and some strength of resistance is shown when attempts are made to pull the rod away. Failure may be due to defective development. If a cube is placed in the palm of the child's hand, practically all cases exhibit a reflex closure and are able to hold the block for a few moments. In 20% to 49% of children, ability to make the thumb straighten out, partially or completely, in order to assist in

the grasping reaction, is found. If the child is held to a table so that his hands just touch it, in 65% to 84% of cases, he will react to the surface by simple fingering or manipulation. Four months infants advanced in development will make exploratory movements. By six months this type of reaction is common. Hand-to-mouth reactions are beginning to manifest themselves at four months. Each item of behavior mentioned above was exhibited by the case observed.

Language Development at Four Months

From birth the infant does a certain amount of vocalizing ranging from violent crying to cooing. This is preparation for the acquisition later on of a vocabulary. At four months the child is beginning to produce sounds like Ah, Eh, EEh, Ooh. Two or more sounds are definitely produced by 65% to 84% of subjects. Such behavior was noticed in the case observed.

Adaptive Development at Four Months

The only type of adaptive behavior shown is that classified as eye-hand co-ordination. The child is just beginning to perceive the world about him, a fact which is manifested in several ways. Practically all four months babies follow moving persons, at least a little, with the eyes. Eighty-three per cent are able to follow a plate moving slowly from right to left or up and down. Blinking at a sharp sound is shown by the majority; to a threatening hand, by 84% of the group; and to a pencil by 1% to 19%. The ability to notice a spoon

has developed in 50% to 64%, but only 20% to 49% notice a small red cube. A few are able to reach for a spoon, but this is a relatively rare reaction.

With two exceptions each type of reaction mentioned above was exhibited by the case observed. She did not blink at a pencil nor was she able to reach for a spoon. This does not in any way indicate inferior development as these responses are shown by only a few children at four months.

## Personal-Social Development at Four Months

At this age level, infants are beginning to respond to personal-social situations. They react in a certain manner to persons, and exhibit a type of play behavior.

### Reaction to Persons

The majority make definite recognition responses at the time of nursing. They are also beginning to make selective and responsive reactions to the human face. The observed case scored in both of these items.

### Play Reactions

Nearly all four months children have developed playful reactions. Enjoyment of the bath is practically universal, absence of this is apt to indicate retardation. Laughing aloud is not quite as common and is assigned a B rating. The majority have started to play with their hands and with objects. Many

have begun to scratch, in play, such things as the side of their crib, pillow, or dress. The majority of this group are attentive to the voice, turning their head at such a sound. A few even turn their head to the sound of a bell. A definite reaction to music is quite common, and 20% to 49% will stop crying for it.

The case examined had developed to the extent of exhibiting each type of personal-social behavior mentioned above.

Thus, one can see that there is considerable growth in each of the fields of behavior during the first four months of life. The greatest strides are made in motor development. At the same time there is considerable advance made in adaptive behavior and personal-social relations. Probably, the least progress is made in the field of language, although even here the foundation for later advance is being laid.

See next page for summary of the four months case observed in this study.

DEVELOPMENTAL SCHEDULE — Four Months Level

| No. of Item | | Gesell's Ratings | Case D.L. (2) |
|---|---|---|---|
| P.11 | Selective attention to face | B | B |
| M 1[illegible] | Holds head erect | B | B |
| M 10 | Resists head pressure | C | C |
| M 13 | Back resistant | C | B |
| M 14 | Tries to sit up | C | C |
| | Sits with support | A | A |
| M 12 | Lifts head prone | C | C |
| | Chest | B | B |
| M 20 | Crawling reaction | C | C |
| | Side to back | C | C |
| | Back to stomach | A | A |
| M 24 | Pushes with feet | C | C |
| L 10 | Vocalization | B | B |
| A 10 | Follows moving persons | C | C |
| | Plate | B | B |
| A 11 | Blinks at sound | C | C |
| | At hand | B | B |
| | At pencil | A+ | A+ |
| P 42 | Turns head to voice | C | C |
| | To bell | A | A |
| M 32 | Hands react to table | B | B |
| A 13 | Regards spoon | B+ | B+ |
| A 16 | Reaches for spoon | A+ | A+ |
| A 13 | Regards cube | A | A |
| M 31 | Clasps cube | C | C |
| | Picks up cube | A+ | A+ |

DEVELOPMENTAL SCHEDULE — Four Months Level

| No. of Item | Developmental Items | Gesell's Ratings | Case D.L. |
|---|---|---|---|
| M 30 | Resists rod withdrawal | C | C |
| M 31 | Thumb opposition | | |
| | Partial | C | C |
| | Complete | A | A |
| M 33 | Hand to mouth | C | C |
| A 15 | Dangling ring: reacts | C | C |
| | Closes in | A | A |
| A 12 | Paper on face: reacts | C | C |
| | Defensive hand | A | A |
| P 12 | Anticipatory motor adjustment | B | B |
| P 40 | Laughs aloud | B | B |
| P 41 | Plays with hands | C | C |
| | Scratches | B | B |
| | Plays with objects | B+ | B+ |
| P 10 | Adaption nursing/recognition | C | C |
| P 40 | Enjoys bath | C | C |
| M 23 | Kicks feet in bath | C | C |
| | Splashes with hands | A | A |
| P 42 | Music: attends | C | C |
| | Stops crying | A | A |
| | Age in months | | 4 |

(2) The only case of four months observed in present study.

Ratings underlined in black denote failure to respond in satisfactory manner.

## Motor Development at Six Months

### Postural Control

From four to six months there is a slight gain in postural control. The child's back is more resistant when he is being handled. More children of this age try to sit up, and a few do manage to sit without support - 1% to 19%.

Three children were observed at this age. They were all able to sit without support, a rather advanced state of development according to Gesell.

### Locomotion

While at four months the majority of babies showed some sort of wriggling or squirming reaction when placed in a prone position, at this age 65% to 84% are able to completely roll over from back to stomach or from stomach to back. Splashing with the hands in the bath is practically universal at six months. This group has developed considerably more power in their feet than was the case at four months. Twenty to forty-nine per cent will make a rhythmic stepping response if the child is held with his feet touching the floor lightly.

With the cases studied these reactions were exhibited as would be expected according to Gesell's ratings. The most noticeable deficiency was a child who had not developed to the point of splashing in the bath which probably indicates little as she showed average development in other ways. Two of the three children could hitch or creep. Less than 20% responded in such manner in the Gesell investigation.

Prehension

Ability to grasp at six months has advanced over that of four months to a noticeable extent. Manipulation of the table edge or surface is now shown by practically all babies. Ability to pick up a cube has developed in 65% to 84% of children, while 20% to 49% are able to scoop up a small sugar pellet with a whole hand reaction. Reaching with one hand has been established in about half the cases. A few, 1% to 19%, show preference for one hand, even at this young age. Power to hold a cube in each hand has developed in 65% to 84% of babies, and 50% to 64% will drop one or both cubes to get a third cube offered to them. Brushing aside or throwing objects to the floor at six months denotes favorable motor development and is exhibited by 20% to 49% of children.

In comparing the results of this study with those of Gesell, the frequency of motor reactions at six months seem to follow the same general trend. Little of value in the way of tendencies can be deduced from three cases. There are two items which might be mentioned as not following the same general line as Gesell found. He gave a rating of A+ to item M14. That is, at the most not more than 20% of six months children are able to sit without support. The three cases studied were all able to sit up. They did not show particularily marked advancement in other reactions. The second item noticed is M 20 - ability to hitch or creep, also given an A+ rating. Two of the three cases manifested this type of behavior.

## Language Development at Six Months

At six months there is little advance made over four months except that there is much distinct vocalization with many new sounds. Gesell's schedules are not detailed enough to study this line of development. Ability to say 'mama' or 'dada' is shown by 1% to 19% of children. None of the cases studied had advanced to this stage.

## Adaptive Behavior at Six Months

### Eye-Hand Co-ordination

Blinking at a pencil is shown by only a few babies at four months (receiving an A+ rating) but, by the time the child is six months, it is a common reaction (receiving a B rating). The majority of six months children notice a small red block. They are also able to grasp a dangling ring. Grasping the ring when it is held above the head is accomplished by 50% to 64%; persistent reaching for it occurs in 20% to 49% of cases. Whereas, at four months reaching for a spoon was given an A+ rating, it now receives a B rating, denoting increased ability to perceive and reach for an object. Definite exploratory movements, when a cup, plate, and spoon are placed in front of the child, are manifested by the average six months infant. From 65% to 84% of cases react to a sheet of paper by crumpling it.

Recovery of Objects

A second type of adaptive behavior is exhibited at six months which was not noticed in the younger group, namely, a consdiousness of objects has been developed, extending in many cases to definitely being aware of their immediate loss and in some cases to looking for the lost object. If an object in which the child is interested, is dropped on the floor or brushed off the table, 65% to 84% are conscious of its loss, and 20% to 49% will definitely look for it. Moreover, if a red block with which the child is playing, is suddenly covered with a cup, 65% to 84% will lift the inverted cup. Gesell had one, six months baby who showed interest in securing the cube from its cover. He considers the test a very important one. "Mental processes required for the solution of this situation follow closely the paradigm of Binet's definition of intelligence." (1) The reaction, however, may be due to two reasons. The child may lift the cup because he realizes that his block has been covered by it, or he may lift the cup because it is an agreeable object to play with. In the latter case, the lost block would probably not be connected in any way with the cup. Gesell apparently considers only the former reason for lifting the cup. Yet, if an inverted cup (without the block) is placed on a table in front of six months children, many of them will consider it an interesting object and will pick it up. In this study, the three cases reacted to the inverted cup. In every

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(1) Gesell - "The Mental Growth of The Pre-School Child" Page 113.

case there was the question in the writer's mind as to whether the child was reacting to the situation or whether he was merely attracted by the cup as he would be by any other object placed in front of him.

The six months children observed responded in the above manner to practically all items requiring adaptive behavior, except that more children scored than was expected on the tests involving manipulation of and reaching for a spoon.

Personal-Social Development at Six Months

Reactions to Persons.

Six months children show a definite recognition of persons which begins, as a rule, by recognizing the ones who care for them. Many - 65% to 84% - have also developed a consciousness of strangers. This "implies discrimination and perhaps a higher level of emotional development." (1) If the child is held before a mirror there is a decided motor response to the image in 20% to 49% of cases.

Play Behavior:

Considerable advance in the field of play behavior is made between four and six months. Many six months children will frolic when played with. Active response to playful reactions denotes a relatively advanced social and emotional development.

(1) Gesell - "The Mental Growth of The Pre-School Child" Pg. 136

It is practically universal for this group to play with objects. Patting the table or banging a spoon is also typical. Throwing objects is an advanced form of play and is given an A rating. The average child of six months will turn his head promptly and definitely when a bell is rung, denoting ability to attend to sounds. Attention to music and stopping crying bedause of it is characteristic. Laughing and smiling is a common accompaniment to music at this age. Similar personal-social responses were made by the six months group of the present investigation.

Distinct advance is thus seen to be made in each field of behavior between four and six months. This would be particularily noticeable if children of these two ages could be observed during the same period. Unfortunately, such an opportunity was not available. Development is also very noticeable if the same child can be studied at four months and again at six months. Such an occasion presented itself.

Cases D. L. and 6. 3 D.L. (1) were the same child. At

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(1) Method of numbering the cases observed:

The first number indicates the age level, the second number the specific case. The initials are those of the child.

The numbers 6, 9, 12, and 18 are used for the corresponding ages in months. The numbers 2,3,4,5 are used for the corresponding years. For example, case 4.3 is the third case in the 4 year old group; 6.2 is the second case in the 6 months group.

the second examination she seemed much more mature. Improved postural control was noted which had resulted in ability to sit alone. She could pick up a cube, and was able to hold two blocks. Preference for one hand had begun to show itself. Throwing objects to the floor was a common type of behavior. She was also vocalizing a great deal more, making several distinct sounds not heard during the first period of observation. There was noticeable development in the field of adaptive behavior. While she noticed the red blocks the first time, she was more interested in them the second period. The dangling ring was a source of greater interest to her at six months than at four months. Ability to just close in on the ring had developed to ability to persistently reach for and clasp it above her head. She was able, at the later period, to reach for a spoon, and quite enjoyed manipulating the cup, saucer, and spoon. Growth was shown in the playful reactions exhibited. Compared with her behavior at four months, she distinctly entered into the spirit of the game when froliced with. At four months she looked pleased and smiled. Playing with objects was extended, to playing with the table, throwing objects, and banging spoons.

See next page for the summary of the six months cases observed in this study.

DEVELOPMENTAL SCHEDULES — Six Months Level

| No. of Items | Developmental Items | Gesell's Ratings | Cases observed in Present study | | |
|---|---|---|---|---|---|
| | | | 6.1 S.R | 6.2 D.C | 6.3 D.L |
| M 10 | Holds head erect | C- | C | C | C |
| M 14 | Sits with slight support | B+ | B+ | B+ | B+ |
| | Alone | A+ | A+ | A+ | A+ |
| M 22 | Rolls back to stomach | B | B | B | B |
| M 20 | Hitches or creeps | A+ | A+ | A+ | A+ |
| M 25 | Makes stepping movements | A | A | A | A |
| P 11 | Shows consciousness of strangers | B | B | B | B |
| M 32 | Hands react to table | C- | C | C | C |
| P 41 | Pats table | B | B | B | B |
| A 17 | Manipulates spoon, cup, | B | B | B | B |
| | Saucer; exploratory manipulations | A | A | A | A |
| P 41 | Bangs spoon | B | B | B | B |
| A 16 | Reaches directly spoon | B | B | B | B |
| M 34 | Inhibits head and one hand | A | A | A | A |
| | Manipulates with one hand | A | A | A | A |
| A 11 | Blinks at pencil | B | B | B | B |
| P 42 | Turns head to bell | B | B | B | B |
| A 13 | Regards cube | C | C | C | C |
| | Pellet | B+ | B+ | B+ | B+ |
| M 32 | Secures pellet - whole hand | A | A | A | A |
| | Fine Prehension | A+ | A+ | A+ | A+ |
| M 32 | Picks up cube | B | B | B | B |
| A 31 | Lifts inverted cup secures cube | B<br>A+ | B<br>A+ | B<br>A+ | B<br>A+ |

## DEVELOPMENTAL SCHEDULES — Six Months Level

| No. of Item | Developmental Items | Gesell's Ratings | Cases observed in Present study | | |
|---|---|---|---|---|---|
| | | | 6.1 S.R | 6.2 D.C | 6.3 D.L |
| A 30 | Fallen object - conscious | B | B | B | B |
| | of; looks for | A | A | A | A |
| M 35 | Holds 2 cubes | B | B | B | B |
| | Drops one for third | B+ | B+ | B+ | B+ |
| M 36 | Releases objects: throws to floor; | A | A | A | A |
| | drops into cup, imitation | A+ | A+ | A+ | A+ |
| A 15 | Dangling ring: closes in; | C | C | C | C |
| | Clasps | B | B | B | B |
| | Above head | B+ | B+ | B+ | B+ |
| | Persistent reaching | A | A | A | A |
| M 34 | Preference for one hand | A+ | A+ | A+ | A+ |
| A 18 | Paper: crumples | B | B | B | B |
| P 13 | Reacts to mirror images | A | A | A | A |
| A 18 | Purposeful reaction | A | A | A | A |
| P11 | Expresses recognition | B | B | B | B |
| P 40 | Frolics when played with | B+ | B+ | B+ | B+ |
| P 41 | Plays with objects | C | C | C | C |
| M 23 | Splashes in tub | B | B | B | B |
| P 41 | Casts objects for noise | A | A | A | A |
| P 42 | Reacts to music; stops crying | B | B | B | B |
| | Coos | A | A | A | A |
| | smiling, laughing | B+ | B+ | B+ | B+ |
| P 30 | Takes bottle in and out of mouth | A | - | A | A |

DEVELOPMENTAL SCHEDULES Six Months Level

| No. of Item | Developmental Items | Gesell's Ratings | Cases observed in Present study | | |
|---|---|---|---|---|---|
| | | | 6.1 | 6.2 | 6.3 |
| L 10 | Says mama, dada or equivalent | A+ | A+ | A+ | A+ |
| | Actual age in months | | 6 | 6 | 6 |

Note - ratings underlined in black denote failure to respond to the particular item in a satisfactory manner.

## Motor Development at Nine Months

### Postural Control

By nine months ability to sit alone is practically universal among normal children. Many infants of this age have developed to the extent of standing with help; the item receives an A rating in Gesell's investigations.

### Locomotion

Ability to creep or hitch is more frequent at nine months than at six months. This type of behavior is shown by 20% to 49% of babies. Rhythmic, stepping movements are made by 65% to 84%, and a few are able to walk with help.

### Prehension

Development is quite noticeable from six to nine months in this division of motor behavior. It is easy for the nine months child to pick up a small pellet with his whole hand, and the majority are able to pick it up with a pincer movement of thumb and forefinger. Hand to mouth reaction is on the wane at nine months although it is still exhibited in 50% to 64% of cases. There is a progressive increase from six months to one year in ability to manipulate with one hand. At nine months the majority are able to use one hand independently, at twelve months this had developed into preference for one hand. Acceptance and retention of a small block in each hand is found in nearly all nine months children. From 65% to 84% will drop one of these cubes to get a third one, and from 20% to 49%

will accept the third cube without dropping the other two. Ability to place a block in a cup, after having been shown how by the examiner, is displayed in a few advanced cases.

Drawing

Well developed nine months babies may start to use a pencil in imitative scribbling. Gesell found that 1% to 19% of cases would do some sort of scribbling - perhaps only a faint scrawl or a few dots. In the present investigation none of the children responded.

In the field of motor behavior the same general tendencies were exhibited as those in Gesell's investigation. Five, nine months children were observed, also, one child of a year was examined on the nine months schedule. The only type of behavior where no response was elicited, and it might have been expected that one child would react in such a manner, was the drawing item, that is, ability to make some sort of mark on paper. A higher proportion of the children examined in this study were able to stand and walk with help than Gesell indicated. Four of the five cases responded successfully. Gesell found that only 20% to 49% were able to accomplish this feat.

Language Development at Nine Months

According to Gesell, 65% to 84% of children are able, at nine months, to say 'mama' or 'dada.' Also, in 20% to 49% of cases, their vocabularies have extended to one other word.

Comprehension or motor adjustment to certain words is beginning to appear at nine months, 50% to 64% adjusting.

Such development was not observed by the writer. Only one of the five cases was able to say 'mama' or 'dada' and her vocabulary ended with these two words. Two cases showed a tendency to adjust to words which is about what would be expected.

The higher stage of development in the field of language as indicated by Gesell, in comparison to the present study, is also found at other age levels.

## Adaptive Development at Nine Months

### Eye Hand Co-ordination

Grasping for a dangling ring above the head is displayed in practically all nine months cases. Persistent reaching and pulling the ring down is shown in 65% to 84% of subjects. Interest in and use of the string attached to the ring appears in 20% to 49% of children. Ability to grasp a spoon directly and accurately is a common reaction. The majority will also reach for a string dangled in front of them. "Reaching is a reaction of fundamental importance in infancey. Variations in promptness, directness, and accuracy undoubtedly have a correlation with the developmental status of the child." (1) Purposeful reaction to a sheet of paper, and manipulation of a spoon, cup, and saucer are also responses commonly found at nine months.

The nine months children observed were successful more

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(1) Gesell - Page 107.

frequently with the above tests than those examined by Gesell.

Imitative Behavior

Gesell notes two imitative reactions which he found in 20% to 49% of cases. These are, first, ability to imitate the rattle of a spoon in a cup; and, secondly, ability to ring a bell after the examiner has rung it. None of the five cases studied displayed the first type of reaction, and only one child was able to ring the bell. It would be doubtful if imitation was a factor in this case.

The significance of these responses does not seem to be quite clear to Gesell. He notes in a comment on the latter item that a less ambiguous test should be devised.

Recovery of Objects.

Nearly all nine months babies are conscious of fallen objects and will look for them. They will also lift an inverted cup which has been placed over a block with which they have just been playing; 20% to 49% will recover the cube. A new test is introduced at this level. The examiner wraps a cube in paper while the child is looking and in which he is interested, then hands it to the infant and notes his reaction. In 1% to 19% of cases, he will secure the cube by unwrapping or manipulation. The nine months child is prompted by a native curiosity or exploratiVeness. In the cases studied, none scored on the latter item.

Comprehension

Advanced comprehension at nine months is denoted if the

child will place a cube in a cup upon command and gesture from the examiner. Gesell found that 1% to 19% of his cases exhibited this type of behavior. No child observed had attained such a state of development.

## Personal-Social Development at Nine Months

### Reactions to Persons

These children, in 50% to 64% of cases, definitely react to a mirror image. Ability to wave bye-bye is shown by about half of children at nine months, and ability to say 'bye-bye' is found in 1% to 19% of cases.

Gesell thinks that this item has some normative value because it is an almost universal custom to teach a baby to wave bye-bye. The trick was not observed once at nine months by the writer, and was found only once at the twelve months level. The type of home, and the fact that several of these children heard a second language in the home may have had something to do with inability to respond in this manner. However, case 9. 1 S.R. comes from an English-speaking, middle class home. She was quite advanced in several ways but scored a failure in this test. Of course, one case is not sufficient evidence.

### Play Behavior

Frolicing when played with is a common reaction at this age. Gesell finds that 50% to 64% have learned to play peek-a-boo. Case 9 1 S.R. was the only one of the five cases studied

who could play this little game. Failure looks to be on a par with failure to wave bye-bye. It seems as if Gesell's ratings are high, or that these tricks of behavior are not taught as frequently in poorer homes where the mother is working as they are in middle-class homes. It might be noted that with the exception of case 9. 1 - S.R. the nine months babies observed came from homes where the mother was employed and the children were in a day nursery.

Patting the table and banging objects are common reactions. Thrusting a cube into a cup is an advanced form of play and is given an A+ rating. Some reaction to music is usually made at this age; 65% to 84% of babies will dance, and 50% to 64% will coo or laugh on hearing music. The five, nine months children observed by the writer responded in a similar manner to Gesell's groups.

Between six and nine months noticeable mental growth is made. At six months some children were able to sit alone for a few seconds. At nine months practically all can sit alone, and a few are able to stand with help. This is quite an advance in postural control. In the field of locomotion, at six months a few could make rhythmic stepping movements, at nine months the response is fairly common. Ability to grasp has developed during these three months so that the older child is able, in practically all cases, to pick up a pellet with the whole hand. Greater ability in prehension is also shown in one-hand manipulation, and in power to accept a third cube. The six months child who was able to reach for a

dangling ring, at nine months is able to persistemtly reach for it, pull it down, and in 20% to 49% of cases play with the attached string.

Development is also noticed in language behavior and in personal-social situations. More advanced play reactions are noted.

Cases 6 1 - S.R. and 9. 1 - S.R. are the same baby. A much better picture of mental growth is obtained by comparing the same child at two age levels. Ability to sit alone, in this case, had developed into ability to walk with help. The words 'mama' and 'dada' had been added to her list of sounds which she had been making for some months. Reaching and grasping movements displayed during the second period of observation were much more accurate, prompt, and definite than at six months. She was more mature socially, exhibiting more advanced play behavior, and showing more interest in those around her.

See next page for the summary of the nine months cases observed in this study.

## DEVELOPMENTAL SCHEDULE — Nine Months Level

| No. of Item | Developmental Items | G's Rts. (1) | Cases observed in Present study 9.1 H.Z | 9.2 J.M | 9.3 R.S | 9.4 R.K | 9.5 F.M | 9.6 S.R |
|---|---|---|---|---|---|---|---|---|
| M 14 | Sits alone | C | C | C | C | C | C | C |
| M 25 | Makes stepping movements | B | B | B | B | B | B | B |
| M 15 | Stands with help | A | A | A | A | A | A | A |
| M 26 | Walks with help | A | A | A | A | A | A | A |
| M 20 | Hitches or creeps | A | A | A | A | A | A | A |
| P 41 | Pats table (prompt adjustment) | B | B | B | B | B | B | B |
| A 17 | Exploratory manipulation spoon etc. | B | B | B | B | B | B | B |
| P 41 | Bangs spoon | C | C | C | C | C | C | C |
| A 16 | Reaches directly spoon | C | C | C | C | C | C | C |
| | String | B | B | B | B | B | B | B |
| A 30 | Fallen spoon - looks for | C | C | C | C | C | - | C |
| M 35 | Holds 2 cubes | C | C | C | C | C | - | C |
| | Drops for third | B | B | B | B | B | - | B |
| | Accepts third | A | A | A | A | A | - | A |
| M 33 | Inhibits hand to mouth | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 31 | Lifts inverted cup | C | C | C | C | C | - | C |
| | Secures cube | A | A | A | A | A | - | A |
| M 34 | Manipulates with one hand | C | C | C | C | C | C | C |
| P 41 | Puts cube in cup (play) | A+ | A+ | A+ | A+ | A+ | - | A+ |
| A 40 | " " " " (commission) | A+ | A+ | A+ | A+ | A+ | - | A+ |
| M 36 | Releases cube in cup - imitation | A | A | A | A | A | - | A |
| A 20 | Imitates spoon in cup | A | A | A | A | A | A | A |
| M 40 | Scribbles imitatively | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| A 32 | Unwraps cube | A+ | A+ | A+ | A+ | A+ | - | A+ |

DEVELOPMENTAL SCHEDULE — Nine Months Level

| No. of Item | Developmental Items | (1) G's. Rts. | Cases observed in Present study | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 9.1 H.Z | 9.2 J.M | 9.3 R.S | 9.4 R.K | 9.5 F.M | 9.6 S.R |
| A 18 | Purposeful reaction to paper | B | B | B | B | B | B | B |
| M 32 | Secures Pellet | C | C | C | C | C | - | C |
| | Fine Prehension | B | B | B | B | B | - | B |
| A 15 | Dangling ring: grasps above head | C | C | C | C | C | C | C |
| | Pulls down | B | B | B | B | B | B | B |
| | Regard for string | A | A | A | A | A | A | A |
| | Persistent reaching | B | B | B | B | B | B | B |
| A 21 | Rings bell - imitation | A | A | A | A | A | A | A |
| P 13 | Reacts to mirror images | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | Plays | A | A | A | A | A | A | A |
| L 10 | Mama, dada, or equivalent | B | B | B | B | B | B | B |
| L 11 | One other word | A | A | A | A | A | A | A |
| | Two | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| L 20 | Adjusts to words | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| P 14 | Waves bye-bye | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | Says bye-bye | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| P 40 | Frolics when played with | C | C | C | C | C | C | C |
| | Plays peek-a-boo, pat-a-cake | B+ | B+ | B+ | B+ | B+ | B+ | B+ |

## DEVELOPMENTAL SCHEDULE — Nine Months Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 9.1 H.Z | 9.2 J.M | 9.3 R.S | 9.4 R.K | 9.5 F.M | 9.6 S.R |
| P 30 | Puts bottle in mouth | | | | | | | |
| P 42 | Reacts to music; dances | B | B | B | B | - | B | B |
| | Coos | B+ | B+ | B+ | B+ | - | B+ | B+ |
| | Actual age in months | | 12 (2) | 9 | 9 | 10 | 9 | 9 |

(1) - G's. Rts. - Gesell's Ratings.

(2) - In comparing the results of the cases observed with Gesell's ratings case 9.1 - H.Z. must be disregarded because of the fact that she is twelve months of age and the schedule is a nine months schedule.

NOTE - Ratings underlined in black denote failure to respond to the particular item in a satisfactory manner.

## Motor Development at Twelve Months

### Postural Control

By twelve months postural control is fairly well advanced. Nearly all babies can stand with help and about half are able to stand alone. Those who can't stand alone by the first birthday, unless seriously retarded, acquire such ability within the next few months.

### Locomotion

Ability to climb manifests itself in 50% to 64% of year old children. Stepping movements are practically universal and walking with help is accomplished by 65% to 84% of cases. Quite a number of advanced children walk alone.

### Prehension

Fine prehension by twelve months is a common occurence. Inhibition of and preference for one hand is shown in 65% to 84% of cases. Ability to accept and hold objects has developed over that of nine months - the majority are able to accept three blocks at a time.

### Drawing

Some advance has been made in the field of drawing. From 65% to 84% of children are able to scribble imitatively

by twelve months. Ability to scribble spontaneously is a more advanced type of response which is accomplished by 20% to 49% of cases.

Seven, one year old children were studied. Motor development in these cases was found to follow the same general tendency as Gesell indicates in the developmental schedules. There appears to be two exceptions. Gesell found that 65% to 84% of children show a preference for one hand at twelve months. In the cases observed for the present study, this was true of only one child.- a rather low proportion. Ability to walk with help and to climb appeared more frequently in this group than in Gesell's.

Language Development at Twelve Months

Gesell found at one year that 85% to 100% of children had added three words as well as 'mama' or'dada' to their vocabulary. A number used four words, and 1% to 20% used five.

The language standards indicated by Gesell, are higher than were observed by the writer. The same tendency was noted at six and nine months. Whereas, Gesell found that 85% to 100% of children have acquired three words and quite a number four or five words in addition to 'mama' or 'dada', in this study six out of the seven children observed had not started to talk.

## Adaptive Behavior at Twelve Months

### Eye - Hand Co-ordination

By twelve months, eye - hand coordination is definitely established in normal children. Ability to grasp a dangling ring, pull it down, and play with the attached string is practically universal.

### Imitative Behavior

Gesell found imitation to be a factor in behavior at one year. From 65% to 84% of children will ring a bell and rattle a spoon in a cup imitatively. If a rubber doll with a whistle is poked by the examiner, 20% to 49% of babies will respond imitatively. Reactions to blocks are easily evoked at this age and form a basis for several tests in studying development. Blocks are placed in front of the child, and the examiner builds a tower of two or three cubes. By motions and commands the subject is asked to build one too. From 50% to 64% will respond adaptively by placing one block on another or on the examiner's tower, 20% to 49% will make a tower of three cubes.

### Recovery of Objects

Twelve months children display quite mature behavior in reacting to the tests included in this division compared with that of nine months old. Practically all are able to secure a

cube covered by a cup, and 60% respond to the wrapped cube situation. As mentioned before, Gesell attaches considerable importance to the last type of reaction.

Comprehension

Ability to understand develops to a certain extent between nine and twelve months. Gesell found that 85% to 100% of cases are able to place a block in a cup on command. Also, that 1% to 19% will place it in a cup, plate or box as told by the examiner.

Discriminative Performance

Discriminative performance is a type of response which begins to manifest itself about twelve months. If a performance box is held in front of the child and a rod handed to him, in 65% to 84% of cases, the subject is able to thrust the rod in the hole. This ability can also be brought into play in the form board test. A form board is presented and the circle handed to the child. With 20% to 49% of children, the circle is placed in the hole without the child being shown; in 65% to 84% of cases, the circle is placed after being shown. Although the form board Gesell used was not obtainable, similar results to Gesell's were found in the use of the Healy and Ferdinald form board.

In the writer's investigation the same general trends in adaptive behavior were observed between nine and twelve months

as Gesell found. There were however, two exceptions. First, imitative behavior had not developed as extensively as was expected. The records of the seven cases observed are found on page 57 , hence it is not necessary to examine them in detail here. In practically every test in which imitation was a factor, fewer children responded than had been anticipated. It may be concluded from these results that ability to imitate had not yet developed to any extend in the majority of these children.

Secondly, tests involving comprehension were passed fewer times then Gesell's ratings indicated. His investigation revealed that 65% to 84% of twelve months children are able to obey such a simple command as placing a block in a cup, and that 1% to 19% are able to discriminate between a cup, plate and box in placing a cube. Of the seven children examined by the writer only four understood when told to put a block in a cup and none of them could discriminate between a cup, plate and box.

## Personal-Social Development at Twelve Months

### Reactions to Persons

By twelve months, the majority react to mirror images, either in a passive way or by a tendency to play. About the same number are able to say 'bye-bye' and 50% to 64% have learned to say 'hello' and 'thank you'. From 65% to 84% have learned that some things are not permissible and will

inhibit action when "No, no" is said to them. This test contributes to an estimate of their personality development.

Initiative and Independence

Behavior involving initiative and independence has developed to some extent in advanced, year old children. Ability to ask for things at the table by pointing received an A rating, and by name, an A+ rating. The latter response is largely dependent upon language, and the child who has not developed in the field of language will not score in this respect. A few children at twelve months have learned to make it known in some way when they wish to go to the toilet. Training is the big factor here.

Personal Habits

The child of one year should attempt to accomplish a few things for himself and thus begin the establishment of personal habits. The majority will try to put on their shoes at a year. About half or less have started to feed themselves with a spoon. From the standpoint of personality development, insistence upon dressing and feeding oneself is significant. Bowel and bladder control is beginning to be established about this time. Reasonable bowel and bladder regularity and control is a habit in 1% to 19% of cases.

Play Behavior

The majority of year old children have advanced to the

stage of playing with blocks. Thrusting a cube into a cup spontaneously is an advanced form of play displayed by 20% to 49% of babies. Playing with a cup, spoon, and saucer is practically universal, as also is playing little games as peek-a-boo and pat-a-cake. Laughing or dancing on hearing music is quite a common response by twelve months of age.

In the cases observed personal-social behavior was not as mature, in some respects, as was expected. These children had not learned to say 'bye-bye', 'hello', or 'thank you.' Environment is probably responsible to a large extent. They would likely receive less training than the group Gesell observed.

In two respects play behavior was poorly developed. Whereas, 85% to 100% of children are expected to play such games as pat-a-cake and peek-a-boo, it was found that only two out of seven had learned these tricks. Also, fewer children responded to the mirror test than Gesell indicates. However, a larger number than expected played with blocks. Again environment may be a factor. Probably these children received much less attention and were played with less than those studied by Gesell.

In comparing the year old child with the nine months baby, it is quite noticeable that reactions are gradually becoming more numerous. Postural control has become fairly well established. Practically all children are able to stand with help at twelve months, and nearly half can stand alone.

Hitching, creeping, and climbing are common movements. Ability to walk with help is shown in a fair number of cases and some have developed sufficiently to walk alone. Preference for one hand is becoming fixed.

Advancement in language is also taking place. The child's vocabulary is increasing and at one year often includes several words.

Adaptive reactions to environment are more mature. A greater number of children display imitative reactions than at nine months. Responses to the covered and wrapped cube situations are more frequent. Discrimination is shown for the first time about this age.

Perhaps the most marked development is in the field of personal-social behavior. Not only has the child advanced in his reactions to persons and his play behavior, but he is beginning to establish personal habits.

See next page for the summary of the twelve months cases observed in this study.

DEVELOPMENTAL SCHEDULE — Twelve Months Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 12.1 M.C. | 12.2 N.M. | 12.3 J.J. | 12.4 C.R. | 12.5 J.W. | 12.6 H.Z. | 12.7 R.W. |
|---|---|---|---|---|---|---|---|---|---|
| A 32 | Unwraps cube | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 18 | Purposeful reaction to paper | C | C | C | C | C | C | C | C |
| A 15 | Dangling ring: Pulls down | C | C | C | C | C | C | C | C |
| | Uses string | B | B | B | B | B | B | B | B |
| A 16 | Reaches for spoon | B | B | B | B | B | B | B | B |
| A 52 | Form board : circle | A | A | A | A | - | A | - | A |
| | Shown | B | B | B | B | - | B | - | B |
| M 32 | Secures pellet: fine prehension | C | C | C | C | C | C | C | C |
| A 21 | Rings bell - imitation | B- | B | B | B | B | B | B | B |
| A 22 | Hits rubber doll - imitation | A | A | A | A | A | A | A | A |
| A 20 | Imitates rattle spoon in cup | B | B | B | B | B | B | B | B |
| A 50 | Performance box: rod in hole | B | B | B | B | - | B | - | B |
| M 34 | Preference for one hand | B | B | B | B | B | B | B | B |
| P 13 | Plays with mirror images | B | B | B | B | B | B | B | B |
| P 14 | Waves bye-bye | B | B | B | B | B | B | B | B |
| | Says bye-bye, hello | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| P 43 | Plays peek-a-boo, pat-a-cake | C | C | C | C | C | C | C | C |
| P 30 | Asks for things at table - pointing | A | A | A | A | A | A | A | A |
| | By name | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| L 20 | Adjusts to words | C | C | C | C | C | C | C | C |

DEVELOPMENTAL SCHEDULES — Twelve Months Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 12.1 M.C. | 12.2 N.M. | 12.3 J.J. | 12.4 C.R. | 12.5 J.W. | 12.6 H.Z. | 12.7 R.W. |
|---|---|---|---|---|---|---|---|---|---|
| M 15 | Stands with help | C | C | C | C | C | C | C | C |
| M 25 | Makes stepping movements | C | C | C | C | C | C | C | C |
| | Stands alone | A | A | A | A | A | A | A | A |
| M 26 | Walks with help | B | B | B | B | B | B | B | B |
| | Alone | A | A | A | A | A | A | A | A |
| M 20 | Can creep | C | C | C | C | C | C | C | C |
| | Climb | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| L 11 | Says 3 words | C | C | C | C | C | C | C | C |
| | Says 4 words | B | B | B | B | B | B | B | B |
| | Says 5 words | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| P 41 | Plays purposefully with cup etc | C | C | C | C | C | C | C | C |
| P 41 | Plays with blocks | B | B | B | B | B | B | B | B |
| A 23 | Builds tower of 1 | B | B | B | B | B | B | B | B |
| | " " " 2 | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | " " " 3 | A | A | A | A | A | A | A | A |
| M 35 | Takes 3rd cube without dropping | B | B | B | B | B | B | B | B |
| M 34 | Inhibits hand to mouth | B | B | B | B | B | B | B | B |
| A 31 | Secures covered cube | C | C | C | C | C | C | C | C |
| P 41 | Puts cube in cup - play | A | A | A | A | A | A | A | A |
| A 40 | Puts cube in cup - commission | C | C | C | C | C | C | C | C |
| A 41 | Box, cup, or plate | A+ | A+ | A+ | A+ | A+ | A+ | - | A+ |
| M 40 | Scribbles - spontaneously | A | A | A | A | A | A | A | A |
| | Imitatively | B | B | B | B | B | B | B | B |
| M 15 | Stands alone | A | A | A | A | A | A | A | A |

## DEVELOPMENTAL SCHEDULE — Twelve Months Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 12.1 M.C. | 12.2 N.M. | 12.3 J.J. | 12.4 C.R. | 12.5 J.W. | 12.6 H.Z. | 12.7 R.W. |
|---|---|---|---|---|---|---|---|---|---|
| P 16 | Inhibits on command | B | B | B | B | B | B | B | B |
| P 22 | Bowel control | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| P 23 | Bladder control | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| P 35 | Asks for toilet | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| P 20 | Tries to put on shoes | B | B | B | B | B | B | B | B |
| P 21 | Uses spoon | A | A | A | A | A | A | A | A |
| P 42 | Reacts to music - vocalization | B | B | B | B | B | B | B | B |
| | Actual ages in months | | 14 | 15 | 15 | 12 | 12 | 12 | 12 |

(1) - G's. Rts. - Gesell's ratings.

NOTE - Ratings underlined in black denote failure to respond to the particular item in a satisfactory manner.

# CHAPTER VI

## MENTAL DEVELOPMENT AT 18 and 24 MONTHS

### Motor Development at 18 Months

#### Locomotion

Ability to move about is universal in eighteen months children. Considerable difference is noticed in comparing the child of twelve months with that of eighteen months as it is during this period that the majority learn to walk. At twelve months about half can take a few unsteady steps if assisted. At one-and-a-half years practically all children are walking, running, and climbing in a relatively mature manner.

#### Prehension

Grasping ability is continually improving. The child is able at eighteen months to accept and hold a number of objects. From 65% to 84% are able to grasp four blocks at once. The child at this age can also toss a ball into an open box.

#### Drawing

Between eighteen months and five years considerable advance is made in capacity to use a crayon or pencil. Gesell found that 65% to 84% of children are able to scribble spontaneously and can make a vertical stroke after being shown how by the examiner. If this is accomplished, the examiner then draws a circle and requests the child to do likewise. Ability to adjust to this situation, that is, changing from a stroke

to a circle, indicates a more advanced type of behavior. From 20% to 49% of cases score successfully. The test involves imitation and adjustment, hence, it might also be classed as adaptive behavior. However, "It must be understood throughout the schedules that we do not wish to confine this or any other test by any rigid limitation of its classification in the syllabus." (1)

In comparing the behavior of the five children observed with that of the cases reported in Gesell's investigation, the same general trends were found in motor development. However, it should be mentioned that the drawing test involving imitation were scored a failure in every case. It was noted in Chapter V that the twelve months children in the present study scored less often than was expected when imitation was a factor. Spontaneous scribbling was displayed more frequently than indicated on the schedule.

## Language Development at 18 Months

### Vocabulary

With Children as young as eighteen months it is impossible to list the actual number of words in their vocabularies. The size of the vocabulary is probably quite significant in judging development. The majority at this age have acquired five

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(1) Gesell - "Mental Growth of the Pre-School Child" pg. 84.

words. Naming one familiar object on a simple four picture card is accomplished by 20% to 49% of subjects, naming two objects by 1% to 19%.. Some children are able to combine two or more words appropriately and significantly at eighteen months. Ability to do so denotes advanced development.

Comprehension

Gesell uses two tests to observe ability to comprehend. This capacity is not well developed at one-ahd-a-half years. From 20% to 49% of children are able to point to two objects on a picture card when the objects are named by the examiner. If three or four can be pointed out, the rating is A+.

Ability to name one object in the Dutch Home picture is displayed by 1% to 19% of children.

Reproduction

The child of this age is just beginning to be able to repeat things said. Half can repeat one or two words. Gesell states that positive evidence is more significant than negative evidence.

At eighteen months, as at the younger levels (see Chapter V), the children observed by the writer do not appear to be as advanced in language development as those studied by Gesell. Only one child had a vocabulary of five words, and only one (the same child) was able to name one or two objects on a simple picture card. None of the subjects combined two or more words together. Ability to name an object in the

Dutch Home picture, and to repeat things said was shown by two cases which is a fair proportion according to Gesell's ratings.

## Adaptive Behavior at 18 Months

### Imitation

As the child grows older imitation becomes a more important factor. Gesell uses several tests to discover whether imitation is present. Hitting a rubber doll in an imitative fashion is done by 65% to 84% of cases. The block building tests are continued at this age. The majority are able to pile three blocks, and 20% to 49% pile four on the examiner's tower. A higher stage of development is shown if the child builds his own tower in imitation of a model. From 50% to 64% build a tower of three cubes independently. Building a bridge in imitation of a model is a more difficult task and only accomplished by 1% to 19% at eighteen months.

### Comprehension

The same tests are used at this level as at twelve months. Upon command to place a block, 50% to 64% are able to discriminate between placing in a cup and plate, 20% to 49% between a cup, plate, and box.

### Discriminative Performance

More difficult situations are presented to the eighteen months child than at twelve months. He is given a square,

and the performance box is placed in front of him. The box has a rectangular hole in it. From 20% to 49% are able to thrust the square through the opening without being shown how. With the form board there are more children who are able to solve the problem than at the younger age levels. Ability to place the circle without being shown is manifested by 50% to 64% of cases; ability to place it when shown, in 65% to 84%. Children who are advanced in development can place the triangle when shown and a small number without being shown. Several situations may be created with the form board which give a rather good opportunity for studying the child's capacity to discriminate and adapt himself to the problem..

Apperception and Completion

There is one test presented to eighteen months children to test appreception. Six cards representing different stages in the drawing of a watch from a mere circle to a complete watch are presented to the child, beginning with the simplest forms. Each time the child is asked "What is that?" Ability to name the watch on the fourth view is given an A+ rating. There is a gradual increase in capacity to designate the pictures at the various age levels.

In comparing the results obtained in adaptive behavior with those of Gesell, there is the same general trend throughout.

## Personal- Social Development at Eighteen Months

### Reactions to Persons

By eighteen months most children are able to say 'hello' and 'thank you'. They also have learned that certain objects must not be touched and will inhibit without command. Seriously retarded children do not often show this ability. Of course, success in such a test depends to a considerable extent on training.

### Personal Habits

The child of one-and-a-half years should make efforts to feed and dress himself. Ability to put on shoes is given an A+ rating. From 65% to 84% are able to use a spoon. The same proportion have established bowel regularity and control. Bladder control is accomplished by 20% to 49%.of cases.

### Initiative and Independence.

Asking for things at the table by pointing is a response shown by the majority of eighteen months children; asking by name by 20% to 49% of cases. The same number are able to let adults know when they wish to go to the toilet. Climbing for objects is one way of showing initiative and independence - a response made by 20% to 49% of children.

### Play Behavior

Thrusting a cube into a cup is a play reaction made by

65% to 84% of children. Fondness of pictures and stories is not generally manifested until a later age. Usually interest is rather fleeting at eighteen months as it is determined by maturity of attention. A pronounced interest in pictures plus a story is shown by 20% to 49%, and an interest in pictures alone by 50% to 64% of cases.

Acquired Information

The first type of information usually acquired by young children is a knowledge of different parts of their bodies. From 65% to 84% are able to point to one part as the eyes, ears, or nose; 20% to 49% know two parts. Ability to count to two or three is displayed by a few advanced children, also to repeat part of the alphabet. Success in the two last mentioned tests depends largely on training, a fact which must be considered in judging a child's developmental status.

In personal-social behavior similar tendencies to Gesell's were manifested by the eighteen months children studied by the writer except that every child failed in the counting and alphabet tests. A larger number of cases than expected showed an interest in pictures.

The most noticeable advance in the period twelve to eighteen months is probably that the child has learned to walk. Ability to use a pencil or crayon is just beginning to develop

and makes rapid progress during the next few years.

In the field of language there is a gradual increase in vocabulary, and in understanding the language of other people.

In adaptive behavior, imitation has developed slightly over twelve months. Responses show increased comprehension and improved adjustment to environmental situations.

Personal-social reactions have matured to some extent during the period between twelve and eighteen months. The child is becoming more sociable, he is learning a few necessary habits, he occasionally displays some initiative and independence, his play behavior is of a more advanced type, and he is acquiring a few facts of information. These responses are all signs of development.

See next page for the summary of the eighteen months cases observed in this study.

DEVELOPMENTAL SCHEDULES — Eighteen Months Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 18.1 G.S. | 18.2 A.J. | 18.3 W.C. | 18.4 N.C. | 18.5 J.J. |
|---|---|---|---|---|---|---|---|
| | Differentiates | A | A | A | A | A | A |
| M 42 | Imitates Vertical Line | A- | A- | A- | A- | A- | A- |
| | Horizontal line | A+ | A+ | A+ | A+ | A+ | A+ |
| A 51 | Performance box: square | A | A | A | A | - | A |
| A 22 | Hits doll imitatively | B | B | B | B | B | B |
| M 36 | Throws ball in box | B | B | B | B | B | B |
| L 21 | Pictures: points to 1 or 2 | A | A | A | A | A | A |
| | More | A+ | A+ | A+ | A+ | A+ | A+ |
| L 30 | Picture 11 - names 1 object | A+ | A+ | A+ | A+ | A+ | A+ |
| A 60 | Names watch 4th view | A+ | A+ | A+ | A+ | A+ | A+ |
| P 51 | Points to one part of the body | B | B | B | B | B | B |
| | Two or more | A | A | A | A | A | A |
| L 40 | Repeats things said | A | A | A | A | A | A |
| P 14 | Says hello, thank you | B | B | B | B | B | B |
| P 16 | Habitually inhibits certain acts | B | B | B | B | B | B |
| P 49 | Looks at pictures | B+ | B+ | B+ | B+ | - | B+ |
| P 44 | Listens to stories with pictures | A | A | A | A | - | A |
| P 52 | Counts to 2 or 3 | A+ | A+ | A+ | A+ | A+ | A+ |
| | Part of alphabet | A+ | A+ | A+ | A+ | A+ | A+ |
| P 22 | Bowel control | B | B | B | B | B | B |
| P 23 | Bladder control | A | A | A | A | A | A |

DEVELOPMENTAL SCHEDULES — Eighteen Months Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 18.1 G.S. | 18.2 A.J. | 18.3 W.C. | 18.4 N.C. | 18.5 J.J. |
|---|---|---|---|---|---|---|---|
| M 26 | Walks alone | C | C | C | C | C | C |
| M 20 | Climbs stairs | C | C | C | C | C | C |
| P 34 | Climbs for objects | A | A | A | A | A | A |
| L 11 | Says five or more words | B | B | B | B | B | B |
| P 30 | Asks for things at table | C | C | C | C | C | C |
| | By words | A | A | A | A | A | A |
| L 14 | Two or more together | A+ | A+ | A+ | A+ | A+ | A+ |
| P 41 | Plays with cup, and cubes | B | B | B | B | B | B |
| A 23 | Blocks : tower or three | C | C | C | C | C | C |
| | tower of four | A | A | A | A | A | A |
| A 24 | Builds bridge | A+ | A+ | A+ | A+ | - | A+ |
| M 35 | Accepts fourth cube | B | B | B | B | - | B |
| A 41 | Places cube in cup, plate | B+ | B+ | B+ | B+ | B+ | B+ |
| | Cup, plate and box | A | A | A | A | A | A |
| A 52 | Form board: circle | B+ | B+ | B+ | B+ | - | B+ |
| | shown | B | B | B | B | - | B |
| | Triangle | A+ | A+ | A+ | A+ | - | A+ |
| | Shown | A | A | A | A | - | A |
| | Adapts circle | A | A | A | A | - | A |
| A 27 | Folds paper once - imitation | A+ | A+ | A+ | A+ | A+ | A+ |
| M 40 | Scribbles spontaneously | B | B | B | B | B | B |
| | Imitatively | B | B | B | B | B | B |
| M 41 | Imitates strokes | B | B | B | B | B | B |

DEVELOPMENTAL SCHEDULES — Eighteen Months Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 18.1 G.S. | 18.2 A.J. | 18.3 W.C. | 18.4 N.C. | 18.5 J.J. |
|---|---|---|---|---|---|---|---|
| P 35 | Asks for toilet | A | A | A | A | A | A |
| P 20 | Puts on shoes | A+ | A+ | A+ | A+ | A+ | A+ |
| P 21 | Uses spoon well | B | B | B | B | B | B |
| L 12 | Pictures: names 1 or 2 | A | A | A | A | A | A |
| | More | A+ | A+ | A+ | A+ | A+ | A+ |
| | Actual age in months | | 18 | 21 | 21 | 18 | 18 |

(1) - G's. Rts. - Gesell's Ratings.

NOTE - Ratings underlined in Black denote failure to respond to the particular item in a satisfactory manner.

## Motor Development at Two Years

### Drawing

From two years on there is gradual improvement in ability to walk, run, and climb. The child of five is much more advanced in this type of motor development than the child of two. There is also improvement in the use of the fingers, demonstrated particularily in drawing. It is the latter type of development which Gesell follows up in his schedules.

The vertical stroke is the easiest mark for the young child to make (excepting scribbling). From 65% to 84% at two years are able to make a vertical line when shown how by the examiner. A horizontal stroke and a cross apparently are more difficult tasks, being accomplished by 1% to 19% of cases. Only 20% to 49% of cases are able to imitate a circle. Copying from a model implies a higher grade of ability than direct imitation. From 1% to 19% are able to copy a circle from a model. In presenting these tests to children of two years, it is difficult to secure their attention.

At the two year age level nine cases were observed. None of them were able to draw a cross. Of course, Gesell indicates that this is rather an advanced state of development. Ability to draw a vertical line should be shown by the majority, but in this study only one child passed the test. Drawing a horizontal line, a circle imitatively, and a circle from a model was accomplished by fewer children than would be expected.

## Language Development at Two Years

### Vocabulary

Ability to name objects increases considerably between eighteen months and two years. Naming five to seven objects on the simple picture cards is accomplished by 65% to 84% of children, eight or nine objects by 20% to 49%. Willingness to attend is tested by this item as well as familiarity with the objects and their names. Naming a key, watch, pencil, penny, and closed knife is accomplished by 50% to 64% of subjects. Ability to speak sentences or combine two or more words together has developed in the majority at this age. A few advanced children use pronouns and plurals.

### Comprehension

From 65% to 84% of two year olds are able to point to five to seven objects on the picture cards, and 50% to 65% to seven or more when the objects are named by the examiner. The child's comprehension of common prepositions is tested by asking him to place a ball 'on', 'in', 'behind', 'in front of a box', and 'under' a chair. Two or these are understood by 65% to 84% of children, and three by 50% to 65%.

The language development of the children studied at the two year level was not as advanced in some respects as was expected. No child could name the five objects mentioned above. Gesell found that 65% to 84% of his cases were successful. The Stanford scale requires only three of the objects

to be named correctly at the three year level. Environment must play a part in this test. The test requiring the child to point to seven or more objects on the picture cards was failed by every subject - Gesell found that 50% to 64% accomplished this task. Ability to name outline pictures and to understand common prepositions was found in a lower proportion of cases than indicated on the schedule.

## Adaptive Behavior at Two Years

### Imitation

The child's capacity to imitate is gradually increasing. Ability to build a tower and bridge has developed over that of eighteen months. A tower of four blocks is made by 65% to 84%, and over four by 50% to 64%. A more exacting test, passed by 20% to 49%, is that of copying a bridge from a model. A paper folding test is presented at this age. A piece of paper is folded transversely across the middle and then at right angles. Success in imitating the first fold fold is obtained by 65% to 84% of cases, and both folds by 1% to 19%.

### Comprehension

Gesell mentions only one test in the two year schedule by which to judge comprehension, namely, placing a ball in a plate, cup, or box, The majority are able to discriminate between these three objects. It is hardly necessary to state

that comprehension is a factor in all tests.

Discriminative Performance.

The form board is used to test this type of response. Several situations can be created which vary in difficulty thus giving the more advanced child an opportunity to display his ability.

Apperception and Completion

Only one test in this field is presented to the two year old - the watch naming test. Considerable difference is noted between eighteen months and two years. Whereas, at the former age only 1% to 19% recognize the incomplete picture on the fourth view; at two years 65% to 84% name it. Also, 20% to 49% recognize it from the third view, and 1% to 19% from the second view.

The results of this study in adaptive behavior follow practically the same tendencies as Gesell indicates by his ratings. The tower building tests were responded to successfully more frequently, and the paper folding test involving imitation less frequently than by Gesell's group.

Personal-Social Development at Two Years

Reactions to Persons

Showing affection spontaneously has developed in 65% to 84% of two year olds. This item throws some light on the

personality and social maturity of the child. Relating recent experiences and occurrences reveal personality development to some extent. The majority of children are able to do this in at least a fragmentary manner at two years of age.

Personal Habits

Attempts at dressing and feeding oneself become more successful by two years. Gesell found that 1% to 19% could put on their own shoes. Practically all could feed themselves with a spoon by the second birthday. Bowel control should be established and in the majority of cases bladder control.

Initiative and Independence

Ability to ask for what is wanted at the table is shown by most two year olds. Home training may make a difference. If the child's wants are anticipated and supplied, he may not have opportunities to make requests. Climbing for desired objects and opening doors are common reactions. As Gesell does not include these two tests on the two year developmental schedule, the writer has no results for them. Doubtless the majority would have scored successfully.

Play Behavior

The larger proportion of two year olds show a definite interest in picture books and will listen to a story based on the pictures. Dramatic play is beginning to appear. From 65% to 84% will imitate simple acts like a queer walk, smoking, or reading. This item, Gesell considers, gives a good opportun-

ity to record specific forms of play which have considerable developmental significance. Request for tunes is made by the average child of two years. It was impossible to secure information on the latter item at this age and the older levels.

Acquired Information

By two years, 65% to 84% are able to point to two or more parts of the body. Some knowledge of name, age, and sex is manifested, 20% to 49% know their first name. Color names are used by 20% to 49% of children. The mere use of color names, whether appropriately or not, is scored a success. However, correct naming of even one color denotes a more advanced state attained by less then 20%.

Several quite noticeable differences are found in comparing the scores of the writer's study with Gesell's ratings in the field of personal-social behavior. First, in observing children's reactions to other persons, Gesell gave a B rating to the ability to show affection spontaneously. In this investigation eight of the nine children passed the test - information for the ninth was not secured. The seemingly higher proportion may be real or it may be due to faulty interpretation on the part of the examiner. Two year children may only be mimicing instead of really being affectionate.

Secondly, ability to relate experiences is apparently quite a common response. In this study only one child scored.

Thirdly, in establishing personal habits Gesell found that 20% to 49% put on their shoes at two years. Every child

observed by the writer scored a success on this item. The explanation may be that children coming from homes of a lower socio-economic status have to manage by themselves more often than in middle class homes. Also, a larger number had acquired bladder control than Gesell indicates.

Fourthly, in play behavior the children observed scored more frequently in both tests than was anticipated. Listening to stories with pictures, and imitative play responses were reactions common to all except one. She did not care for stories. Information regarding imitative play behavior was not obtained for one child.

Fifthly, ratings for tests depending upon acquired information were lower than those found in this study. No child was able to give his full name, nor did anyone use color names. Gesell found that 20% to 49% had advanced to this stage. Also, only one child knew his first name - Gesell's proportion is 65% to 84%. Success in these tests depends to some extent on training. There is indication, both here and in other tests, that the training in the homes from which the children of this study came was different than that given to the children Gesell studied.

Comparison of the eighteen months child with the one of twenty-four months shows more clearly the development made during this period. In motor behavior there is increased ability in the field of drawing. Ability to imitate geometric lines and figures is more advanced than at eighteen months although the responses are still relatively immature.

In the field of language the child shows increased capacity to recognize and name familiar objects and outline pictures. The use of pronouns and plurals is beginning to develop. Putting words together and the speaking of short sentences is an advance over eighteen months. Increased comprehension of language is manifested in a number of ways.

Reactions to environment and imposed situations are more intelligent than heretofore. The ability to imitate is found oftener and in more difficult situations. Situations requiring comprehension and discrimination are solved in more cases than at eighteen months and, comparatively, in a more decided manner. Ability to recognize objects is improving.

Personal-social development is indicated by responses to social situations becoming more frequent. A larger number are able to take part in feeding and dressing themselves. Bladder and bowel control is established in the majority of cases. Asking for things desired is a common response. Play behavior is acquiring a more advanced form e.g. imitating life situations. The child is beginning to learn a few facts of information which he can produce when asked for them.

The child of two when compared with the child of eighteen months seems much more mature. But, when placed beside the child of three, it is easily recognized that the next year will bring forth considerable development and that he is now relatively immature.

See next page for the summary of the two year children observed in this study.

DEVELOPMENTAL SCHEDULES — Two Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 2.1 F.F | 2.2 A.L | 2.3 M.W | 2.4 B.B | 2.5 C.T | 2.6 R.M | 2.7 S.L | 2.8 R. | 2.9 W.C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L 14 | Speakes sentences | B | B | B | B | B | B | B | B | B | B |
| L 15 | Pronouns, past, plural | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| P 17 | Tells experiences | B | B | B | B | - | B | B | B | B | B |
| P 30 | Asks for things at table by name | B | B | B | B | - | B | B | B | B | B |
| A 23 | Builds tower of 4 blocks | B | B | B | B | B | B | B | B | B | B |
| | More | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 24 | Bridge | A | A | A | A | A | A | A | A | A | A |
| A 41 | Puts cube in cup, plate, box | B | B | B | B | B | B | B | B | B | B |
| A 70 | Number: "just one" differentiated | A | A | A | - | A | A | A | A | A | A |
| A 52 | Form board: solved in time | B | B | B | B | B | B | B | B | B | B |
| | no errors | A | A | A | A | A | A | A | A | A | A |
| | Adapts: in time | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | No errors | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| A 27 | Folds paper - imitatively once | B | - | B | B | B | B | B | B | B | B |
| | Square fold | A+ | - | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| M 43 | Drawing: copies circle | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| M 42 | Imitation: vertical | B | B | B | B | B | B | B | B | B | B |
| | Horizontal | A | A | A | A | A | A | A | A | A | A |
| | Circle | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | Cross line | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| L 21 | Picture cards: points 5 - 7 | B | B | B | B | B | B | B | B | B | B |
| | Over | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |

DEVELOPMENTAL SCHEDULES — Two Years Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 2.1 F.F | 2.2 A.L | 2.3 M.W | 2.4 B.B | 2.5 C.T | 2.6 R.M | 2.7 S.L | 2.8 R. | 2.9 W.C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L 12 | Picture cards: names 5 | B | B | B | B | B | B | B | B | B | B |
| | NINE | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| L 13 | Names familiar objects | B | B | B | B | B | B | B | B | B | B |
| A 60 | Names watch: 2nd view | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| | 3rd | A | A | A | A | A | A | A | A | A | A |
| | 4th | B | B | B | B | B | B | B | B | B | B |
| P 53 | Tell name | B | B | B | B | - | B | B | B | B | B |
| | Full name | A | A | A | A | - | A | A | A | A | A |
| | Sex | A | A | A | A | - | A | A | A | A | A |
| L 22 | Prepositions: 2 | B | B | B | B | B | B | B | B | B | B |
| | 3 | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | 4 | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| P 56 | Uses color names | A | A | A | A | - | A | A | A | A | A |
| | Names one color | A+ | A+ | A+ | A+ | - | A+ | A+ | A+ | A+ | A+ |
| P 45 | Plays imitatively | B | B | B | B | - | B | B | B | B | B |
| P 44 | Listens to stories with pictures | B | B | B | B | B | B | B | B | B | B |
| P 15 | Shows affection | B | B | B | B | B | B | B | B | B | B |
| P 22 | Bowel control | C | C | C | C | C | C | C | C | C | C |
| P 20 | Puts on shoes | A | A | A | A | A | A | A | A | A | A |
| P 21 | Uses spoon well | C | C | C | C | C | C | C | C | C | C |
| P 23 | Bladder control | B | B | B | B | B | B | B | B | B | B |

DEVELOPMENTAL SCHEDULES — Two Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 2.1 F.F | 2.2 A.L | 2.3 M.W | 2.4 B.B | 2.5 C.T | 2.6 R.M | 2.7 S.L | 2.8 R. | 2.9 W.C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P 42 | Asks for tunes by name (2) | B | | | | | | | | | |
| | Actual ages in months | | 29 | 26 | 25 | | 25 | 28 | 28 | 26 | 24 |

(1) - G's. Rts. - Gesell's Ratings,

(2) - No scores obtained for Item P 42.

NOTE - Ratings underlined in black denote failure to respond to the particular item in a satisfactory manner.

# CHAPTER VII

## MENTAL DEVELOPMENT OF 3, 4, and 5 YEARS

Many of the tests which Gesell uses for ages three, four, and five years are the same. Hence, it might be profitable to discuss the development of these three age levels in four sections only (one for each type of behavior) rather than following the plan of the previous chapters.

### Motor Development

#### Drawing

As mentioned in Chapter VI, from two years on Gesell considers motor development only as related to arm and finger coordination. By three years this ability has improved over that possessed previously. Power to imitate a vertical line and a circle is shown by practically all children of thirty-six months, 65% to 84% can draw a horizontal line and cross in imitation. A higher stage of development is indicated if the child can draw from a model. Drawing of a circle in this manner is accomplished by 65% to 84% of three year olds and is almost universal at four years. A cross is a slightly more difficult task; 20% to 49% score at three years, 65% to 84% at four years. From 20% to 49% are able to copy a square at four years, while at five years practically all are successful. A triangle is more difficult and is accomplished by less than 20% at four years and 65% to 84% at five years. At

five years the test is made even more complicated by adding a square with one diagonal, and a hexagon. The majority are able to score on the former, but few on the latter. The hexagon test receives a rating of A. Copying a diamond using pen and ink is a five year test which is passed by less than 20% of subjects. In this study, as it was not always possible to secure pen and ink, a pencil was used by all subjects. Gesell states that such procedure is permissible in exceptional cases if the examiner wishes data uniform throughout the series.

Coordinated tracing is an ability which makes demands upon intelligence and motor coordination. The latter, however, is the phase stressed. A sheet containing a double diamond and cross is presented to the child. On a demonstration form the examiner draws a pathway around the diamond between the two guide lines, emphasizing that the guide lines must not be touched. The child is then asked to do likewise. At three years 20% to 49% score a success, while at four years the proportion is 65% to 84%. Four and five year olds are asked, after a demonstration, to trace around the cross in a similar manner. The younger children are successful in 50% to 64% of cases, and the older ones in 85% to 100%.

Another test of coordination used is the steadiness fish test. The materials, a cardboard fish with a hole in its eye, and a piece of heavy paper with a two inch chalk circle in the middle, are set up, the fish being placed in the centre of the circle. The child is asked to go fishing and is handed a steel needle with which he speers the fish (through the hole in the eye). Only one hand is used at a

time, testing both right and left hands. (1) Time is taken for each trial, credit being given if on one trial with the right hand the child is successful within fifteen seconds or thirty seconds with the left hand. This is accomplished by 65% to 84% of four year olds. At five years the score is B+ if there are four successes in one minute, or B for three successes in one minute. The test, in addition to being a measure of coordination, serves to liberate personality reactions.

At three years coordination is also judged by observing the ability of the child to place a rectangular card and a straight line into alignment - 65% to 84% score.

In examining the above tests and the proportion who score on each, it can be readily seen that coordination develops considerably from three to five years. At three years the child is able to imitate several, simple, geometric figures. His ability to copy is centred chiefly around the circle. This is extended at five years to copying more complicated figures. Coordinated tracing also develops in the period from three to five years.

In the present study eight children were observed at three years, eight at four years, (2) seven at five years. The frequency of successes in several of the items did not occur according to Gesell's ratings. In the three year group

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(1) For further details of this test see Gesell "The Mental Growth of the Pre-School Child" page - 87.

(2) Two cases at the four year level must be disregarded in comparing the results with those of Gesell - see four year schedule.

ability to imitate the cross, horizontal, vertical, and circle did not appear as often as expected. Also, copying the circle was scored a failure oftener than indicated by the assigned rating. In the four year group, all subjects passed the tests involving coordinated tracing of the diamond and all but one of the cross, whereas, in Gesell's study only 50% to 64% traced the cross and 65% to 84% the diamond. The group also scored more frequently than expected on the steadiness fish test and in copying a square. These results for the four year olds may indicate either superior development or too high ratings.

## Language Development

### Vocabulary

Language development at three years is indicated by increased ability to name pictures on the simple picture cards, ability to speak sentences, and to use correctly I, you, me, plurals and the past tense.

At four and five years some children, in addition to the above, are able to define common words by their use. The words given are chair, horse, fork, doll, and pencil. From 20% to 49% of four year olds, 65% to 84% of five year children can define four out of six.

Five year olds are tested on the first twenty-four words in the Standard vocabulary list. Any response indicating familiarity with the meaning of the word is sufficient to earn a credit. Knowledge of three to eight words is shown

by 65% to 84%, eight to twelve words by 20% to 49% of children. A high rating in the vocabulary test usually has a correlation with general mental ability.

Comprehension

The child of two is generally able to understand two or three of the common prepositions (1). At three years 65% to 84% understand three, and 20% to 49% four or five.

Comprehension of directions and prepositions at four years is tested by drawing instead of actually placing an object, as at three years. The subject is given a picture of a boy sitting down and blowing a bubble. He is asked to draw bubbles under the chair, above his head, in front of, and behind him. Placing under, and above correctly gives a rating of C, placing all four correctly a rating of B+.

Conversation

Ability to name objects in the Dutch Home picture is noticeably greater at three years than heretofore. Practically all three year olds can name three objects in the picture, four objects were named by 22% and six by 18% in Gesell's group. Description occasionally enters into the conversation of very young children. One or more descriptive words may be used by 1% to 19% of three year old children, and by 65% to 84% at the age of four. By five years more than half the responses may be descriptive in reply to the question, "What

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(1) - See test L22 - Gesell - page 94.

is this picture about?", if the child is a high average. Gesell rates this item A+. A higher proportion, 65% to 84% at five years display some interpretation of humor when shown a funny picture.

Reproduction

At three years nearly all cases can repeat six syllables correctly. By four years, 65% to 84% are able to reproduce twelve syllables. Repetition of digits is also tested. Ability to repeat four digits is shown by 50% to 64% of four year olds, and by the majority at five years; ability to repeat five numbers is found in less than 20% at four years, and 20% to 49% of five year olds. At four years about half have overcome infantile articulation, at five years 65% to 84% show few signs of such pronounciation.

The general trend of results in language development shown in this study agrees with the ratings of Gesell. There were several exceptions in the ability of four year children to repeat digits, syllables, and to articulate clearly. More cases scored successes than was anticipated. More three and four year olds used descriptive words, and more four and five year children were able to define words by use than Gesell notes. In the five year group, infantile articulation appeared less often, and more children failed in the vocabulary test than expected.

## Adaptive Development

### Imitation

The block building tests, mentioned in the last chapter, are continued at these age levels to discover the child's ability to imitate. By three years, the majority are able to imitate a bridge and a tower made of more than four blocks At four and five years more difficult tasks are set. The subject is asked to close his eyes while the examiner builds a gate with five blocks. The child is asked to make a similar one. From 20% to 49% score on this test at four years, and 65% to 84% at five years. If the four year old is unable to build a gate from the model, he is shown how by the examiner. From 50% to 64% score after the demonstration. Success after the demonstration does not indicate as high a stage of development as success before. The very upper limit of adaptive imitation is brought into play by a memory stairway test. While the child's eyes are closed a stairway of ten blocks is made. He is told to look at it carefully and count the steps as he is to build one like it. Then the model is knocked down. At four years Gesell found that less than 20% were able to build the stairway again, at five years 50% to 64% were successful. Imitation of the double fold in the paper folding test is accomplished by approximately one-half of the three year olds. A few of this group, and the majority at four and five years are able to imitate a diagonal fold.

In the stairway test the only child who scored (in

either the four or five year group) presented a rather interesting way of solving the problem. Whereas, the other children, observed by the writer, looked at the stairway and merely counted the steps, she made an analysis of the situation saying, "There are four blocks up this way, and three up here, and two up here, and then one." After this, the task of rebuilding it was no problem at all to her and she required only one trial. She was four years and six months, scored a high average throughout the four year schedule except in a few items.

Recovery of Objects.

At the higher age levels puzzle situations are used. These items give opportunity for observing personality reactions when the solution is not obvious. For the three year old a ball is put into a puzzle box while the child is watching. He is then told that if he can get the ball out he may play with it. Three steps are necessary. First, a rod must be slipped from a ring; secondly, a string must be pulled through the ring; and thirdly, the top must be lifted off the box. From 65% to 84% of cases are successful. The most frequent error is to try to pull the ball through an opening which is in the top of the box.

The responses shown by different children are quite informative. Some will try only once or twice, some will persist along one line of action for considerable length of time. Some say "Oh, I can't." Some try every method they can think of. One child displayed a persistent non-adjustive

type of reaction for at least five minutes in spite of the fact that the examiner told him several times that the puzzle could not be solved that way. Doubtless he would have continued longer except that the examiner had no further time.

At five years a garden maze test is presented. From 65% to 84% solve it. A variety of personality reactions again are displayed.

Comprehension

The three commissions test of the Stanford Revision is used to discover errand and commission capacity. Gesell found that at three years from 20% to 49% are able to carry out the commissions in correct order, at four years 50% to 64%, and at five years 65% to 84%. The writer found that in a number of cases the child could do the three tasks but not in the correct order. This is especially true at three years of age.

At four and five years, questions of varying difficulty are given to the child to determine the practical judgment which he possesses. They have only a partial applicability at these age levels as it is the minority who score in all except the first group of questions. Such questions as, "What must you do when you are sleepy? cold? hungry?", can be answered correctly by the majority of four year olds. More difficult questions, answered by only 20% to 49% of four year children, are "What must you do just before you go across the street?" and "What must you do if you have lost something?" The following group, adapted from the Standford Revision, are

too difficult for the average five year old. They are, "What's the thing to do if it is raining when you start to school?", "What's the thing to do if you find that your house is on fire?", and "What's the thing to do if you are going some place and you miss your car?" Less than 20% score on this group at four years, and only 50% to 64% at five years.

Discriminative Performance

This type of ability shows considerable development over that displayed at younger age levels. The majority of three year olds, according to Gesell, are able to discriminate between two lines of unequal length.

At the three age levels the subjects are tested for aesthetic appreciation. They are shown a card containing three pairs of faces, one pretty and one ugly in each pair. The advanced child of three and four will decide which in each pair is the pretty face. By five, from 65% to 84% can discriminate.

The children of these ages are also asked to decide which of two weights (three and fifteen grams) is the heavier. At three years, 20% to 49% score and 65% to 84% at four and five years.

Another discriminative test used at all levels is that of matching forms. A card on which there are a number of geometric forms is placed in front of the child. He is then shown one form at a time (similar to those on the card) and asked to point to the one on the card which is like the one he is being shown. The item is useful as an advanced test for

three year olds. At three years 65% to 84% can match four out of ten forms, 20% to 49% seven or more. At four years 65% to 84% can match seven forms, and at five years successful response is universal.

The four year olds are given two additional tests not included on the three and five year schedules. First, they are presented with three pairs of pictures, one humorous and one not in each pair. Success in picking out the funny picture is shown by 65% to 84%. Gesell thinks that probably comprehension is tested more than the child's sense of humor. The second test is a four block design test. A card containing a red square design made of four smaller squares is presented to the child and four red cubes are given to him. He is asked to put the blocks together so as to look like the picture. The majority accomplish this task at four years. This test might almost be classed in with the test involving imitation of a model.

Apperception and Completion

At three years 50% to 64% of children are able to recognize an incomplete picture of a watch on the second view, and 65% to 84% on the third view.

A completion test which brings intelligence into play is introduced at this age. A picture of a Dutch girl cut in two vertically is out together and shown to the child. The left half is then placed two or three inches to the right of the other piece. The problem for the child is to put the picture together again. Gesell found that 65% to 84% of

three year olds could solve the situation. If the child scores, the left half of the picture is rotated to the left so that it is upside down and he is again asked to complete the picture. This test makes greater demands upon adaptive completion judgment, and is solved by only 20% to 49% at three years.

A second completion test is of value. Sheets containing incomplete outlines of geometric forms are placed before the subject (each sheet contains two or three figures). Colored cardboard forms are handed one at a time to the child and he is asked to place it where it belongs on the sheets containing the incomplete outlines. As the child develops between the ages of three and five years, there is an increasing ability to place the forms correctly. For the ratings for each age level see the developmental schedules.

Other tests used at four and five years which involve ability to complete, judge, and perceive are as follows. First, the child is required to put together a picture which has been cut diagonally. A more difficult problem of the same type is one in which he is required to put together a rectangle of plain cardboard cut diagonally. The latter form of the test is a problem for advanced four year children and the average five year old. The former part is a problem for the average four year child. Secondly, an incomplete man is presented to the four year group. The average child will recognize such a picture. Ability to put in missing parts is shown by nearly all children of this age, the number of parts drawn depending largely upon the stage of development of the

subject. Maturity differences would be noted if the test were applied to the three and five year age levels. Thirdly, the child is asked to detect missing parts in pictures of people. The test is a difficult one for both the four and five year groups. The child tends to see the object as a whole. Ability to notice details denotes an advanced state of development.

Number Concept

Number sense appears to be little developed at three, four, and five years. The task of touching and counting pennies is accomplished by only a few. From 20% to 49% can count four pennies in this manner, 20% to 49% can count to thirteen at five years. If the child must touch the pennies when counting, the problem is more difficult than if he is asked to merely count. The situation probably tests associative verbal-motor association more than number sense.

Ability to place one, two, or three cubes in a cup discriminately is a better indicator of number comprehension. At four years 65% to 84% can discriminate between one and two blocks, and 50% to 64% can place three cubes when asked. This appears to be a rather valuable test in judging the development of number concept. It might be advantageous to make it more extensive.

Drawing of bubbles is another method of determining the child's number ideas. He is asked to draw a definite number of bubbles in certain locations on a picture of a boy blowing

bubbles. Ability to draw two, three, or four bubbles is shown by only the advanced child at four years.

Simple mathematical problems, as "If you have one penny and I give you another, how many will you have?" also serve as indicators of the child's number concepts. Only the superior four year displays a number comprehension beyond two, according to Gesell. It is unfortunate that the test was not included on the five year schedule.

Knowledge of the number of fingers on each hand and of the total number (without counting) is possessed by 50% to 64% of five year children.

The results obtained in this study in observing adaptive behavior at three, four, and five years differ in several respects from Gesell's ratings. There is close agreement in imitative behavior except in two respects. In the memory stairway test (test A 26) in the two groups, four and five years, only one child scored. Gesell's rating at four years is A+, and at five years B+. Also, more four and five year olds imitated a gate from a model successfully than was anticipated.

Several of the tests involving comprehension were scored successes less frequently than expected. Gesell found that 20% to 49% of three year olds could execute three commissions in correct order. In the group observed no child showed similar ability. They could carry out the commissions but not the order. The questions based on comprehension which are on the four year schedule were answered unsatisfactorily. The answers indicated a different type of training than that received by Gesell's group. The most frequent answer to the

question "What must you do before you go across the street" was "Get a spanking." Two children answered "Take my mother's hand." These suggested that likely the children were not allowed to cross the street alone.

Discriminative performance (1) did not appear to be as well developed in the three year group as Gesell indicates. Successful scores for every item presented were fewer than those Gesell obtained. The four and five year olds, however, scored more frequently on the tests given than expected. (2)

Two tests, in the series under apperception and completion, were scored a success by the four year olds more frequently than expected. These were, the ability to name the incomplete man and to draw in three missing parts. Gesell gave these items a B rating. The trend in this study indicates that the rating might possibly be lowered to C, or probably better, the items might be placed in the three year schedule and norms attained at this age. The five year children showed greater ability to match forms, and less in completing a rectangle or in supplying missing parts than those in the Gesell study.

The children of the four year group appeared to have more highly developed number ideas than those observed by Gesell. Further study of number concepts of pre-school children should be made.

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(1) See tests A 53, 54, 55, 57.

(2) See tests A 54, 55, 56, 57, 58.

## Personal-Social Development

### Personal Habits

The child between three and five years makes progress in habits pertaining to feeding and dressing himself and in habits of orderliness. At three years Gesell found that 50% to 64% of cases could put on their own shoes. By the age of four, the child, in the same proportion of cases, can lace his shoes, and by five years the majority can do so. Ability to button clothes is manifested by the average four year old. Washing oneself and brushing one's teeth are habits developed by 65% to 84% of four and five year olds. A few advanced children are able at five years to tie a bow tie.

Ability to use a knife is acquired in 50% to 64% of four year olds. This test depends to a large extent on training. If the child has never been allowed to have a knife, a negative score should not be considered too seriously.

Habits of orderliness can be built up about the third year if there is emphasis placed on them in the home. The three year old will put away his toys if so trained. By the age of five a large percentage will show interest in putting away and arranging things in an orderly manner.

### Initiative and Independence

Errand capacity will have developed in the advanced child of three years, and in the average four year old. Ability to carry breakables as chinaware is characteristic of three year old maturity.

Suggestibility is a trait fairly common to young children. As the child grown older he is better able to resist suggestion. Gesell found that 65% to 84% at four and five years are able to resist suggestion offered by the examiner (1).

Play Behavior

Play takes on a more highly developed form as the child grows older. Gesell's schedules are lacking in items whereby this type of behavior can be adequately studied. The experienced psychologist could supplement the schedule items by judicious questioning of the parent.

At three years the average child is fond of pictures and stories. He also displays a higher grade of dramatic pretense than at two years. There is greater elaboration and detail. One child observed 'telephoned' the examiner every time she appeared to invite her to a tea party.

By four years 20% to 49% are able to draw a man, and by five years 65% to 84%.

The free construction material is informative. The child's imagination, purposefulness, willingness, attentiveness, spontaneity, and critical ability may be observed while he is playing with the material. Relative maturity is displayed by the five year old. Ability to use the constructive material ranges from simple manipulation and inspection to orderly arrangement of the sticks and blocks, to fairly elaborate constructions accompanied by interpretive remarks.

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(1) See Test Page 32 - Gesell

Acquired Information

The advanced three year child is able to recite or recognize a short rhyme or a few letters of the alphabet. He, also, knows whether he is a boy or girl.

Color sense develops between three and five to some extent. The majority of three year olds are able to name one color. By four years, 50% to 64% name two colors, 20% to 49% four colors. The majority at five years of age can name two colors.

Knowledge of the use of money has been learned by four years in most cases. Advanced four year olds, and from 20% to 49% of five year children can name a penny, nickel, dime, and quarter.

Ability to distinguish between right and left is shown by less than 20% of four year subjects, and by 50% to 64% at five years. The average five year knows his age and the advanced child knows whether it is morning or afternoon.

In examining the results of the observations made by the writer, the most notable discrepancy between these and Gesell's ratings is in the development of habits. In practically every test given, more subjects in each of the three, four, and five year groups scored successfully than would be expected by the ratings in the schedules. This tendency may be worthy of further investigation. It looks as if children from homes of lower economic status may establish certain habits at an earlier age than those from middle class homes.

Probably they have to do more things for themselves.

The three year old children observed scored more frequently on the items involving play reactions and less frequently on the tests requiring knowledge of rhymes and color than those Gesell studied.

Resistance to suggestion which was commonly displayed by Gesell's groups of four and five years of age was found lacking in this study. With only a few exceptions these children agreed with the examiner.

An acceptable drawing of a man was presented in a larger proportion of cases in the five year group than in Gesell's investigation.

In comparing children of three, four, and five years with those of two, three and four years respectively, differences indicating development are noticed. In the field of motor behavior, coordination, particularily of the finer muscles, matures considerably between two and five. The child of two can imitate a vertical line, while the five year old is able to trace around a cross or draw a man.

Language development is characterized by increased ability to name objects, speak sentences, use plurals and pronouns, and define words by use.

Situations requiring adaptive capacity display increasing ability each year in imitating, solving problems, discriminating and perceiving. In addition, the child is acquiring more advanced number concepts as he grows older.

Personal-social behavior is characterized by development

of a more complicated habit system. Initiative and independence assert themselves in more advanced forms. Play is more mature. Knowledge and facts are being acquired.

See next page for summary of the three year cases observed in this study - page 105 for the four year cases, and page 109 for the five year cases.

DEVELOPMENTAL SCHEDULES — Three Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study (2) 3.1 B.S | 3.2 B.E | 3.3 P.B | 3.4 F.S | 3.5 F.S | 3.6 L.S | 3.7 R.J | 3.8 A.P |
|---|---|---|---|---|---|---|---|---|---|---|
| L 14 | Speaks sentences | C | C | C | C | C | C | C | C | C |
| L 15 | Uses Pronouns, past, plural | B | B | B | B | B | B | B | B | B |
| A 23 | (Builds) tower of blocks, more than 4 | B | B | B | B | B | B | B | B | B |
| A 23 | Bridge | B | B | B | B | B | B | B | B | B |
| A 27 | Double folds paper | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | Diagonal | A | A | A | A | A | A | A | A | A |
| M 43 | Drawing: copies circle | B | B | B | B | B | B | B | B | B |
| | Cross | A | A | A | A | A | A | A | A | A |
| M 42 | Imitation: vertical | C | C | C | C | C | C | C | C | C |
| | horizontal | B | B | B | B | B | B | B | B | B |
| | Circle | C | C | C | C | C | C | C | C | C |
| | cross | B | B | B | B | B | B | B | B | B |
| M 46 | Traces diamond | A | A | A | A | A | A | A | A | A |
| A 61 | Picture completion | B | B | B | B | B | B | B | B | B |
| A 62 | Picture adaptation | A | A | A | A | A | A | A | A | A |
| A 34 | Removes ball from box | B | B | B | B | B | B | B | B | B |
| A 63 | Form completion 2 of 5 | A | A | A | A | A | A | A | A | A |
| M 45 | Aligns card | B | B | B | B | B | B | B | B | B |
| A 60 | Names watch 3rd view | B | B | B | B | B | B | B | B | B |
| | 2nd view | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| L 12 | Picture cards; names 7-9 | B | B | B | B | B | B | B | B | B |
| L 31 | Enumerates objects in picture 3 | C | C | C | C | C | C | C | C | C |

DEVELOPMENTAL SCHEDULES — Three Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study (2) 3.1 B.S | 3.2 B.E | 3.3 P.B | 3.4 F.S | 3.5 F.S | 3.6 L.S | 3.7 R.J | 3.8 A.P |
|---|---|---|---|---|---|---|---|---|---|---|
| | Enumerates four objects | A | A | A | A | A | A | A | A | A |
| L 32 | One or more descriptive words | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| A 53 | Discriminates lines | B | B | B | B | B | B | B | B | B |
| A 57 | Matches forms: 4 of 10 | B | B | B | B | B | B | B | B | B |
| | 7 of 10 | A | A | A | A | A | A | A | A | A |
| A 54 | Makes aesthetic comparisons | A | A | A | A | A | A | A | - | A |
| P 56 | Names one color | B | B | B | B | B | B | B | B | B |
| | two colors | A | A | A | A | A | A | A | A | A |
| A 55 | Discriminates weights | A | A | A | - | A | A | A | A | A |
| A 71 | Counts four pennies | A | A | A | A | A | A | A | A | A |
| P 53 | Tells sex | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| L 42 | Repeats 6 syllables | C | C | C | C | C | C | C | C | C |
| L 22 | Prepositions: three | B | B | B | B | B | B | B | B | B |
| | four | A | A | A | A | A | A | A | A | A |
| A 42 | Performs 3 commissions | A | A | A | A | A | A | A | A | A |
| P 52 | Knows few letters or rhymes | A | A | A | A | A | A | A | A | A |
| P 45 | Play: pretends | B | B | B | B | B | B | B | B | B |
| P 44 | Likes stories | B | B | B | B | B | B | B | B | B |
| P 17 | Tells stories | B | B | B | B | B | B | B | B | B |
| P 20 | Puts on shoes | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| P 35 | Goes on errands - outside | A | A | A | A | A | A | A | A | A |
| P 39 | Crosses street alone | B+ | B+ | B+ | B+ | B+ | B+ | - | B+ | B+ |

DEVELOPMENTAL SCHEDULES — Three Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study (2) 3.1 B.S | 3.2 B.E | 3.3 P.B | 3.4 F.S | 3.5 F.S | 3.6 L.S | 3.7 R.J | 3.8 A.P |
|---|---|---|---|---|---|---|---|---|---|---|
| P 36 | Trusted with breakables | B | B | B | B | B | B | B | B | B |
| P 26 | Puts away toys | B | B | B | B | B | B | B | B | B |
| P 42 | Recognizes favorite tune (3) | B | | | | | | | | |
| | Actual ages in months | | 36 | 41 | 35 | 35 | 36 | 42 | 44 | 43 |

(1) G's. Rts. - Gesell's Ratings.

(2) - Cases 3.4 - F.S. and 3.5 - F.S. are the same child.

(3) - No scores for item P. 42

NOTE - Ratings underlined in ~~red~~ black denote failure to respond to the particular item in a satisfactory manner.

## DEVELOPMENTAL SCHEDULES — Four Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 4.1 A.P | 4.2 L.S | 4.3 D.D | 4.4 T.L | 4.5 F.M | 4.6 B.C | 4.7 J.S | 4.8 A.B |
|---|---|---|---|---|---|---|---|---|---|---|
| A 25 | Builds gate from model | A | A | A | A | A | A | A | A | A |
| A 25 | " " - imitation | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 70 | Puts 2 blocks in cup | B | B | B | B | B | B | B | B | B |
| | 3 | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 58 | Four block design | B | B | B | B | B | B | B | B | B |
| A 26 | Builds memory steps | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| M 47 | Steadiness Fish Test | B | B | B | B | B | B | B | B | B |
| A 27 | Folds paper diagonally | B | B | B | B | B | B | B | B | B |
| M 43 | Drawing: circle | C | C | C | C | C | C | C | C | C |
| | Copies cross | B | B | B | B | B | B | B | B | B |
| | square | A | A | A | A | A | A | A | A | A |
| | triangle | A | A | A | A | A | A | A | A | A |
| P 46 | Draws man (head,legs) | A | A | A | A | A | A | A | A | A |
| M 46 | Traces diamond | B | B | B | B | B | B | B | B | B |
| | cross | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 66 | Names incomplete man | B | B | B | B | B | B | B | B | B |
| A 67 | Draws completions 3 | B | B | B | B | B | B | B | B | B |
| | 5 | A | A | A | A | A | A | A | A | A |
| A 64 | Completes patience picture | B | B | B | B | B | B | B | B | B |
| A 65 | Completes rectangle | A | A | A | A | A | A | A | A | A |
| A 57 | Matches 7 forms | B | - | B | B | B | B | B | B | B |
| A 63 | Completes forms 2 | B | B | B | B | B | B | B | B | B |
| | 3 | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | 4 | A | A | A | A | A | A | A | A | A |

## DEVELOPMENTAL SCHEDULES — Four Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in present study 4.1 A.P | 4.2 L.S | 4.3 D.D | 4.4 T.L | 4.5 F.M | 4.6 B.C | 4.7 J.S | 4.8 A.B |
|---|---|---|---|---|---|---|---|---|---|---|
| A 68 | Supplies missing parts | A | A | A | A | A | A | A | A | A |
| A 71 | Counts - four | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | ten | A | A | A | A | A | A | A | A | A |
| | thirteen | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| A 73 | Applied no. concept - 2 | A | A | A | A | A | A | A | A | A |
| | 3 | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| A 72 | Draws bubbles - 1 | C | C | C | C | C | C | C | C | C |
| | 2 | A | A | A | A | A | A | A | A | A |
| | 3 | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| L 23 | Obeys 4 prepositions | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 55 | Discriminates weights | B | B | B | B | - | B | B | B | B |
| A 56 | Selects 2 of 3 humorous pictures | B | B | B | B | B | B | B | B | B |
| P 37 | Resists suggestion | B | B | B | B | B | B | B | B | B |
| L 44 | Repeats digits 4 | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | 5 | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| L 43 | Repeats 12 Syllables | B | B | B | B | B | B | B | B | B |
| L 32 | Uses one or more descriptive words | B | B | B | B | B | B | B | B | B |
| A 43 | Comprehends 2 of 3 questions | B | B | B | B | B | B | B | B | B |
| A 44- | Comprehends lost | A | A | A | A | A | A | A | A | A |

DEVELOPMENTAL SCHEDULES Four Year Level

| No. of Item | Developmental Items | G's. Rts. (1). | Cases observed in Present study | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4.1 A.P | 4.2 L.S | 4.3 D.D | 4.4 T.L | 4.5 F.M | 4.6 B.C | 4.7 J.J | 4.7 A.B |
| A 44 | Comprehends street | A | A | A | A | A | A | A | A | A |
| A 45 | Comprehends 2 of questions VI | A+ | A+ | A+ — | A+ — | A+ | A+ — | A+ — | A+ — | A+ — |
| A 42 | Performs 3 commissions | B+ | B+ | B+ — | B+ | B+ — | B+ | B+ | B+ | B+ |
| P 56 | Names 2 colors | B+ | B+ | B+ — | B+ | B+ — | B+ | B+ | B+ | B+ |
| | 4 | A | A | A — | A | A — | A | A | A | A |
| A 54 | Makes aesthetic comparisons | A | A | A | A | A — | A | A — | A — | A |
| L 16 | Defines by use | A | A | A | A | A — | A | A | A | A |
| P 51 | Distinguishes right and left | A+ | A+ | A+ — | A+ — | A+ — | A+ | A+ — | A+ — | A+ — |
| P 56 | Names coins | A+ | A+ | A+ — | A+ — | A+ — | A+ | A+ | A+ | A+ |
| P 54 | Knows money is for purchase | C | C | C | C | C | C | C | C | C |
| P 47 | Uses building material | B | B | B | B | B | B | B | B | B |
| | Constructively | A | A | A — | A | A — | A | A | A | A — |
| L 46 | Non-infantile pronunciation | A | A | A | A | A | A | A | A | A |

## DEVELOPMENTAL SCHEDULES Four Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 4.1 A.P | 4.2 L.S | 4.3 D.D | 4.4 T.L | 4.5 F.M | 4.6 B.C | 4.7 J.J | 4.8 A.B |
|---|---|---|---|---|---|---|---|---|---|---|
| P 35 | Goes on errands - out side | B | B | B | B | B | B | B | B | B |
| P 45 | Plays constructively | C | C | C | C | C | C | C | C | C |
| P 25 | Washes self | B | B | B | B | B | B | B | B | B |
| P 24 | Buttons clothes | B | B | B | B | B | B | B | B | B |
| P 20 | Laces shoes | B+ | B+ | -+ | B+ | B+ | B+ | B+ | B+ | B+ |
| P 21 | Uses knife | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| P 25 | Brushes teeth | B | B | B | B | B | B | B | B | B |
| | Actual age in months | | 57 (2) | 47 | 48 | 56 (2) | 51 | 54 | 51 | 54 |

(1) - G's. Rts. - Gesell's Ratings.

(2) - In comparing the results of the cases observed with Gesell's ratings, cases 4.1 - A.P. and 4.4 - T.L. must be disregarded because of the discrepancy in ages.

NOTE - Ratings underlined in black denote failure to respond to the particular item in a satisfactory manner.

DEVELOPMENTAL SCHEDULES — Five Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 5.1 E.C | 5.2 M.S | 5.3 W.C | 5.4 A.P | 5.5 A.P | 5.6 T.B | 5.7 A.L |
|---|---|---|---|---|---|---|---|---|---|
| A 25 | Builds gate | B | B | B | B | B | B | B | B |
| A 26 | Memory Steps | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| M 47 | Steadiness fish test 4 | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | 3 | B | B | B | B | B | B | B | B |
| A 27 | Folds paper diagonally | C | C | C | C | C | C | C | C |
| M 43 | Copies square | C | C | C | C | C | C | C | C |
| | triangle | B | B | B | B | B | B | B | B |
| | diagonal | B | B | B | B | B | B | B | B |
| | hexagon | A | A | A | A | A | A | A | A |
| M 46 | Traces with co-ordination | C | C | C | C | C | C | C | C |
| A 35 | Threads garden maze | B | B | B | B | B | B | B | B |
| A 63 | Completes forms - 3 | C | C | C | C | C | C | C | C |
| | 4,5 | B | B | B | B | B | B | B | B |
| | 6 | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | 7 | A | A | A | A | A | A | A | A |
| | 8 | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| P 46 | Draws recognizable man | B | B | B | B | B | B | B | B |
| L 34 | Interprets humor | B | B | B | B | B | B | B | B |
| P 37 | Resists suggestion 3 TIMES | B | B | B | B | B | B | B | B |
| | Four times | A | A | A | A | A | A | A | A |
| L 17 | Vocabulary test 3 - 8 | B | B | B | B | B | B | B | B |

DEVELOPMENTAL SCHEDULES — Five Year Level

| No. of Item | Developmental Items | | G's. Rts. (1) | Cases observed in Present study 5.1 E.C | 5.2 M.S | 5.3 W.C | 5.4 A.P | 5.5 A.P | 5.6 T.B | 5.7 A.L |
|---|---|---|---|---|---|---|---|---|---|---|
| | Vocabulary test | 8 - 12 | A | A | A | A | A | A | A | A |
| L 44 | Repeats digits | 4 | B | B | B | B | B | B | B | B |
| | | 5 | A | A | A | A | A | A | A | A |
| A 55 | Compares weights | | B | B | B | B | B | B | B | B |
| P 56 | Names colors | 4 | B | B | B | B | B | B | B | B |
| A 54 | Makes aesthetic comparison | | B | B | B | B | B | B | B | B |
| L 16 | Defines by use | | B | B | B | B | B | B | B | B |
| A 65 | Completes rectangle | | B | B | B | B | B | B | B | B |
| P 53 | Tells age | | B | B | B | B | B | B | B | B |
| P 51 | Distinguishes right and left | | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 68 | Supplies missing parts | | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 71 | Counts pennies | 10 - | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| | | 13 | A | A | A | A | A | A | A | A |
| A 45 | Comprehends questions VI | | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| P 54 | Names 4 coins | | A | A | A | A | A | A | A | A |
| P 55 | Distinguishes A.M. & P.M. | | B+ | B+ | B+ | B+ | B+ | B+ | B+ | B+ |
| A 74 | Tells no. of fingers | | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| L 33 | Describes picture | | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| P 20 | Ties bow knot | | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |

DEVELOPMENTAL SCHEDULES Five Year Level

| No. of Item | Developmental Items | G's. Rts. (1) | Cases observed in Present study 5.1 E.C | 5.2 M.S | 5.3 W.C | 5.4 A.P | 5.5 A.P | 5.6 T.B | 5.7 A.L |
|---|---|---|---|---|---|---|---|---|---|
| M 44 | Copies diamond | A+ | A+ | A+ | A+ | A+ | A+ | A+ | A+ |
| A 42 | Performs 3 commissions | B | B | B | B | B | B | B | B |
| P 26 | Orderly placement in box | B | B | B | B | B | B | B | B |
| P 25 | Washes self | B | B | B | B | B | B | B | B |
| L 46 | Non Infantile Pronunciation | B | B | B | B | B | B | B | B |
| P 20 | Laces shoes | B | B | B | B | B | B | B | B |
| P 47 | Uses building material | B | B | B | B | B | B | B | B |
| | Constructively | A | A | A | A | A | A | A | A |
| | Actual ages in months | | 60 | 63 | 60 | 57 | 60 | 66 | 61 |

(1) - G's. Rts. - Gesell's Ratings.

NOTE - Ratings underlined in black denote failure to respond to the particular item in a satisfactory manner.

# CHAPTER VIII

## AN OUTLINE OF PRE-SCHOOL DEVELOPMENT

In the preceding chapters a detailed analysis has been made of the behavior of the child at a number of age levels. The analysis was based on Gesell's developmental schedules. Development is characterized by continuity. But in using the analytic method, one is apt to lose sight of the continuity. In order to overcome this, a bird's-eye picture of the child's behavior from four months to five years would be valuable.

In the present chapter the general course of development, as observed by the writer, will be presented. This outline is based on the data obtained from the observations made in this study, not upon that given by Gesell. (1)

It must be emphasized again that the following account cannot in any way be taken as normative. It is based on too few subjects. In addition, there was too great variation from the actual age in some cases. In Gesell's investigation, the children were within two weeks of the age being studied. This was impossible in the present study. The outline, then, is a summary of the developmental changes observed in fifty-four children between four months and five years; the cases, with the exception of eight, coming from inferior homes or those of a low economic status.

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(1) - Gesell - "The Mental Growth of the Pre-School Child" Page 209.

## Motor Development

If one handles an infant of several weeks, his postural limpness is surprising, especially if one is better acquainted with older children. By four months, however, postural control is beginning to develop. The child of this age has acquired a certain amount of head control, and his back is resistant. During the next few months more and more control posturally is attained, until at nine months the children observed could sit without support, and those of one year stand with help. That such a drastic change could come over an infant in one year is amazing.

During the same period leg development is rapidly advancing. The four months baby showed some sort of wriggling which was more pronounced by six months. At twelve months creeping had developed, and at eighteen months climbing was a common response. Kicking and splashing in the bath were reactions of the four and six months children. At four months the infant could push with his feet, at nine months he made stepping movements when held under the arms, at twelve months he walked with help, and at eighteen months he walked alone.

Arm and finger development depends upon the maturity of the nervous system. The use of the hand and fingers, therefore, depends considerably on age. The superior child, however develops more rapidly, and the inferior child less rapidly than the average. The four months baby clasped a cube, by six months he could pick it up, by nine months he could scoop up a pellet with a whole hand movement, and by twelve months he picked it

up with the thumb and forefinger. Ability to hold blocks increases with age. At six months, the infant can hold two cubes, at twelve months three. Hand to mouth reaction develops by four months but should be on the wane by nine months. Manipulation with one hand was common at nine months. Preference for one hand develops later.

"The motor development of the pre-school child records itself with approximate precision in drawings which he makes with chalk, crayon and pencil." (1) Drawing in the present study appeared to begin at about twelve months of age in the form of imitative scribbling, and at eighteen months with spontaneous scribbling. Imitative ability developed exceedingly slowly in the children observed. The two year group was not able to imitate even so simple a figure as a vertical line. A few at three years, but not nearly the majority, drew a cross, a vertical line, a horizontal line, and a circle in an imitative fashion.

Copying from a model implies a higher stage of development. This ability first appeared, except in a few cases, at four years. The four year old could copy a circle and cross. Copying a square was too difficult for most of the four year group, but was accomplished by those of five years. A triangle, a still more difficult task, was copied by the majority of

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(1) - Gesell - The Mental Growth of the Pre-School Child
Page 211

five year olds, as also, a square with a diagonal drawn in it. Copying a diamond and a hexagon was found to be beyond the level of the majority of the five year children observed.

Representative drawing denotes a higher stage of development. The four and five year groups were able to draw a man without a copy. Three year children do not make even the semblance of a man.

Gesell states that "Imitative drawing and copying, although conditioned by social factors, are primarily affected by the maturity of the neuromuscular system. In the field of dramatic spontaneous representative drawing, social factors, and personality traits come more conspicuously into play but, basically again, drawing even in this field is determined by broad developmental factors." (1)

Finger coordination becomes more highly developed by four and five years. The children of these groups were able to trace around a diamond and a cross in a relatively mature manner. Steadiness of hand and good eye-hand coordination are displayed by four years. This is observed in the fish test in which a paper fish is speered through a hole in the eye with a steel needle.

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(1) Gesell - "Mental Growth of the Pre-School Child"
Page - 212

## Language Development

The first cry can be considered as belonging to the field of language. This is followed at different ages by vocalization of increasing variety and complexity. The four months baby was noticed to produce sounds as Ah, Eh, Eeh, Coh, Oh. These sounds were replaced by one or two words in the twelve and eighteen months groups. The two year children were using sentences, and the three year olds plurals, pronouns, and the past tense. Descriptive words denote advanced development until four years when the majority were found to be using them. Ability to define common words in terms of use was found in the five year groups.

Increase in vocabulary is accompanied by greater ability to understand the language of others. Familiarity with the use of prepositions was attained between two and five years. The younger children usually understood 'on', and 'under', while the older children had a knowledge of 'above', 'in front of', 'behind.'

Conversation expands rapidly between the ages of two and five. This was noticed especially during the periods of observing. The eighteen months child would appear interested but said little. The three and four year children were characterized by almost continued conversation. The five year old exhibited a tendency to greater continuity of thought and more imagination.

"The language progress which a child makes from three to five years is typified by his ability to use prepositions

appropriately, his employment of descriptive words and his tendency to deal with larger units of thought, his ability to bring clauses and sentences into logical relation both in imaginative and in practical narration." (1)

## Adaptive Behavior

Reaction to environment begins early in life. At four months it was observed that the child followed persons and moving objects with his eyes. The six months infant showed more extended interest in his surroundings characterized by reaching and playing with objects. The responses of nine and twelve months children to objects were more definite and of greater variety.

Interest in present, seen objects was found to extend to interest in unseen objects of which the child had a knowledge. By nine months the children would be definitely aware of a fallen spoon with which they had just been playing and would look for it. Of course, interest would be fleeting and would probably not last for more than a few seconds. By twelve months the child's interest was slightly more sustained. Relatively complicated puzzle situations and mazes were solved by the three, four, and five year olds.

Progress in adaptive behavior can be concretely observed in the block tests. These vary in difficulty and can, therefore, be used at all ages. In many of the tests imitation

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(1) Gesell - "The Mental Growth of the Pre-School Child" Page 221.

is an important factor. Imitation entered in the behavior of the children observed about the age of eighteen months. This group could build a tower of three blocks imitatively, the two year olds one of four, the three year olds one of more than four. More complicated situations could be met by the older children. For instance, the four year child could build a gate imitatively, and the five year old could make the same gate from a model without being shown. These children were also able to imitate double and diagonal paper folds.

Ability to understand and to make discriminative performances grows with age. The twelve months baby could place a cube in a cup upon command. By eighteen months the advanced child could discriminate between a cup, plate, and a box in placing a block, but by two years practically all had developed to this stage.

Errand capacity develops between three and five years. The younger child could be trusted to carry breakables. The older one could complete a series of errands in a definite order.

The four and five year children showed advanced judgment and perception over three years in ability to compare weights, make aesthetic comparisons, select humorous pictures, matching forms, and naming incomplete pictures. Ability to detect and name details in pictures of familiar objects, as the human face, was shown only by the advanced four and five year child.

Personal-Social Development

Under adaptive behavior items which are relatively impersonal are included. Personal-social behavior includes personal reactions. That is, the child's reactions to a social environment is considered. These personalized responses cannot actually be separated from those included under adaptive behavior. The separation here is merely a means of simplifying the discussion.

During the first few months the baby discovers that all his wants and comforts are dependent upon others. By four months he will make anticipatory motor adjustments when an adult picks him up. The six months children had developed one step further in their reactions to persons. They showed expressions of recognition toward certain adults. The two year children displayed reactions of affection.

Personal habits are formed at an early age. While depending considerably upon training, successes in the items on the developmental schedules have significance in estimating maturity of personality. One of the first important habits to be learned is bowel and bladder control. These were established by the children observed at about two years of age.

Interest in feeding and dressing oneself appeared near the first birthday. At the twelve months level the children were trying to put on their shoes. The two year children were successful. Four year children could button their own clothes provided that the buttons were not too inaccessible.

The twelve months group could use a spoon, the two year olds were relatively proficient, and those in the four year group were using a knife.

Habits of washing and brushing teeth were found to be set up by four years. Ability to put away toys in a neat fashion was displayed by the three year olds while interest in the process had developed by five years.

Reactions to situations involving initiative and independence are also indicative of personality maturity. Successful responses increase with age. By the age of three the child could not only go on errands but he showed a decided interest in helping.

Personality development can be partially judged by play behavior. The four months child would laugh aloud, and exhibited simple playful reactions when froliced with. The six months child's responses to similar situations were more definite and decided. The twelve months child played with blocks thrusting them into a cup, and would manipulate a cup, saucer, and plate in a playful manner. The two and three year groups were fond of picture books and stories. Simple imitative dramatic play showed itself at three years, and imitation of more complicated situations at four years. Purposive reactions and imagination were displayed by the four and five year child in playing with the construction materials. Initiative and self-reliance are also brought out in this situation. Gesell attaches considerable importance to these traits. He states, "Nothing is quite so significant of the maturation of the child's personality as the evidences of self-

reliance and of independence with bespeak his growing moral. Normally these evidences undergo consistent increase. Abnormally there are partial or complete arrests which leave aspects of his personality stranded on some pre-school level". (1)

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(1) Gesell - "The Mental Growth of the Pre-School Child." Page 230.

## CHAPTER IX

## TRENDS NOT VERIFIED BY PRESENT STUDY

The behavior of the children observed in the present study followed the same general developmental trends as those reported by Gesell. However, in certain fields of behavior there appeared to be a tendency to vary. In the previous chapters, a more or less detailed recording of the tests which vary has been made when discussing the development shown at each age level. In this chapter general tendencies which differ from Gesell's and which extend over several age levels will be mentioned.

The children of six, nine, and twelve months observed by the writer seemed to have greater postural control and locomotive ability than those observed by Gesell. This is illustrated by several of the developmental items. The three, six months children were able to sit without support. Gesell's rating for this test is A+. The nine months children were able to stand with and without help, and made stepping movements in a larger number of cases than the ratings indicated. Similarily in the year old group, six out of seven could walk with help - to this Gesell assigned a B rating.

Motor coordination of the arm and fingers, according to the results obtained in some tests, appeared to develop earlier than Gesell indicated. In the drawing tests where motor coordination was practically the only factor, the children of the present investigation were further advanced

than those examined by Gesell. This is shown in the tests which required coordinated tracing around a diamond and cross, and also in the steadiness fish test. In the tracing tests the four year olds scored more frequently than those observed by Gesell. In the steadiness fish test there were more successes than expected at both the four and five year levels.

Drawing ability did not display itself at as young an age as it did in the Gesell study. He found that capacity to make a definite stroke developed in the average child near the age of eighteen months. From then on the child gradually acquired the ability to perform more difficult drawing problems. At two years he could imitate a vertical line or circle. The more advanced two year old would imitate a horizontal line and a cross. The three year child imitated a horizontal, cross, and circle. He could also copy a circle from a model.

These abilities had not developed as extensively in the groups observed by the writer. None of the eighteen months children could imitate a stroke. The two year olds were not able, except in a few cases, to imitate a vertical or horizontal line, a circle, or a cross. The successes in the three year group in imitating a cross, horizontal, circle, and in copying a circle and cross were much fewer than in Gesell's three year group. The items used to test drawing ability involve imitative and discriminative performance as well as motor coordination. The large proportion of failures may be due to the imitative and discriminative factors being less fully developed in the present group than in Gesell's group.

It was noted above that items which depended chiefly on motor coordination scored as successes more frequently than Gesell's norms justified. Also, it will be noted farther on that tests in which imitation and discrimination are the main types of behavior scored less frequently than indicated by Gesell's ratings for children under three years of age.

Language development showed two trends which varied from Gesell's standards. Under three years of age vocabulary was not adquired as rapidly as indicated. According to the ratings, children of nine months can usually say "mama" and "dada." At twelve months they have acquired three words, at eighteen months five words. Ability to recognize and name familiar objects Gesell found to be possessed by the average two year old. In the nine and twelve months groups observed very few words, if any, had been acquired by the majority of cases. The eighteen months and two year children did not recognize and name objects as frequently as in Gesell's groups.

The second language tendency which appeared to vary was in the group over three years of age. Language development, in some respects, seemed to be more rapid than that reported by Gesell. More children of three and four used descriptive words. A larger number of four year olds could define words in terms of use. Ability to reproduce was greater in the four year group observed. Overcoming infantile articulation was accomplished at an earlier age. The vocabulary test given at five years, alone scored fewer successes than expected.

In some of the cases observed, though not all, a foreign language was spoken in the home. This may have been partly responsible for the slower language development found before three years.

In adaptive behavior, tests involving eye-hand coordination and manipulation were scored as successful more often than expected according to the schedule ratings. These responses appear to depend to a large extent on development of motor coordination. If this is true, the tendency agrees with that mentioned heretofore - namely, that in the group observed by the writer, motor coordination appeared to develop at an earlier age than reported by Gesell.

The imitative factor in behavior did not appear at as young an age as Gesell indicates. The nine and twelve months groups failed in practically all tests relying on imitation. At eighteen and twenty-four months, the scores were similar for imitative tests except in the paper folding items which were too difficult. But by three years of age imitation seemed to appear in a larger number of cases than Gesell notes. The memory stairway test, however, was too difficult for the four and five year olds.

Several other items were noticed for which the responses were of an adaptive type and for which the results here obtained differ from Gesell's. Most of these variations do not extend beyond one age level. They have been discussed in previous chapters and, therefore, it is not necessary to mention them again, except to note that discrimination performance at the three year level is not developed to the same extent as Gesell

reports. This trend and the retarded imitative development at the early age levels may account for some of the failures in the drawing tests noted previously.

Personal-social behavior observed in the present study showed two trends which did not verify Gesell's norms. The variations might be explained on the basis of training. First, the children observed by the writer were more advanced in habit formation of a certain type. The two and three year olds in all cases were able to put on their own shoes. The four year olds in the majority of cases could lace their shoes, button their clothes, wash themselves, brush their teeth, and use a knife. That is, dressing and feeding habits were more extensively formed in this group than in that observed by Gesell. The habit of orderliness manifested itself more frequently in the three and five year groups. Also, all the three year olds could be trusted with breakables whereas Gesell found that only 65% to 84% could be. It seems reasonable to suppose that these children are required to look after themselves more extensively than Gesell's group who came from middle class homes.

The second variable trend in personal-social behavior may also depend largely on environment. The majority of tests involving teaching by the parents were scored as successes less frequently than reported in the Gesell study. For example, the children observed had not learned little games and tricks as waving bye-bye, playing peek-a-boo, and pat-a-cake which Gesell reports as being responses displayed by the average child of nine and twelve months. Lack of

training is the most probable explanation if Gesell's norms are true. The two and three year children showed a similar tendency in tests de ending upon acquired information. They were able to give their names less frequently and they were no as adapt at reciting or recognizing little rhymes, a few letters of the alphabet, or in naming colors.

The trends of behavior observed which have been mentioned above as appearing to differ from Gesell's norms cannot be considered as indicating real differences. There were too few cases included in the present study to draw such a conclusion. The most that can be said is that in certain fields of behavior the responses to the tests indicate that several of the developmental trends which Gesell reports were not verified by the present study. These tendencies might or might not be established by more extensive observation at each age level.

However, the variations found, even though the group was small, suggest that further research should be done in order to verify Gesell's outline of the mental development which occurs between four months and five years, or, if verification is not forthcoming, to build up a truer developmental picture.

The most obvious problems which the above mentioned differences suggest to the writer are as follows. First, the development of motor coordination might receive additional study with a view to checking or altering Gesell's norms, particularily at the younger age levels. The rate of development of motor coordination may be faster than indicated on the schedules. The second problem is one of language

development. Several questions arise. Does language development take place more slowly before three years of age and more rapidly after three than Gesell indicates? What influence has environment on language development, especially on the child under three? Does a second language spoken in the home have an effect on language development before the age of three years? The third problem raised is in regard to the development of imitative behavior. At what age are imitative responses first found and how rapidly does imitation progress? What types of situations can and will children of different age levels imitate? Fourthly, what effect has environment on the development of adaptive behavior? The last problem to be noted concerns personal-social behavior. How does this type of behavior vary at the different socio-economic levels? Do children coming from homes of a lower economic order develop personal habits of dressing, feeding, and tidiness at an earlier age than those from homes of a higher financial status? In what way do these two groups differ from the viewpoint of acquired information?

Gesell's tests which the present study did not verify are:

| Number of tests | Item | Age in Months at which each was used. |
|---|---|---|
| 1. M 15 | Stands with help | 9 |
| | alone | 12 |
| 2. M 20 | Climbs | 12 |
| 3. M 34 | Preference for one hand | 12 |
| 4. M 41 | Makes a stroke | 18 |
| 5. M 42 | Imitates - vertical | 24 |
| | cross | 36 |
| | circle | 24, 36 |
| | horizontal | 36 |
| 6. M 43 | Copies circle | 36 |
| 7. M 46 | Traces - diamond | 48 |
| | cross | 48 |
| 8. M 47 | Steadiness Fish Test | 48, 60 |
| 9. L 10 | Says "mama" "dada" | 9 |
| 10. L 11 | Uses one word | 9 |
| | three words | 9 |
| | five words | 18 |
| 11. L 12 | Names 5 - 7 pictures | 24 |
| | 8 - 9 " | 36 |
| 12. L 13 | Names 5 objects | 24 |
| 13. L 14 | Combines 2 or more words | 18 |
| 14. L 15 | Uses pronouns, plurals | 24 |
| 15. L 16 | Defines by use | 48 |
| 16. L 17 | Word Test series | 60 |
| 17. L 20 | Adjusts to words | 9 |
| 18. L 45 | Repeats 5 digits | 48 |
| 19. L 46 | Articulation | 48 |
| 20. A 17 | Manipulation | 9 |

| Number of Tests | Item | Age in Months at which each was used. |
|---|---|---|
| 21. A 20 | Imitates rattle of spoon | 9,12 |
| 22. A 21 | Rings bell - imitation | 9,12 |
| 23. A 22 | Hits doll - imitation | 18 |
| 24. A 23 | Builds tower 1,2, blocks<br>more than four | 12<br>36 |
| 25. A 26 | Builds stairway | 60 |
| 26. A 27 | Folds paper - imitation | 18,24 |
| 27. A 40 | Places cube in cup upon command | 12 |
| 28. A 42 | Three commissions | 36 |
| 29. A 53 | Comparison of lines | 36 |
| 30. A 56 | Selects humorous pictures | 48,60 |
| 31. A 57 | Matches forms | 36 |
| 32. A 61, A 62 | Picture completion | 36 |
| 33. A 63 | Form completion | 48,60 |
| 34. A 65 | Patience card | 60 |
| 35. A 66 | Names incomplete man | 48 |
| 36. A 67 | Man completion | 48 |
| 37. A 70 | Places blocks in cup, 1,2,3<br>4 | 48<br>36,48 |
| 38. A 71 | Counts pennies - 10 | 48 |
| 39. A 72 | Draws bubbles | 48 |
| 40. P.14 | Salutations | 9,12 |
| 41. P.15 | Shows affection | 24 |
| 42. P.16 | Forbidden acts | 12 |
| 43. P.17 | Tells experiences | 24 |
| 44. P.20 | Puts on shoes | 24,36 |
| 45. P.21 | Uses spoon | 18 |
| 46. P.22 | Bowel control | 18 |

| Number of tests | Item | Age in Months at which each was used. |
|---|---|---|
| 47. P.24 | Buttons clothes | 48 |
| 48. P.25 | Washes self<br>Brushes teeth | 40,60<br>48 |
| 49. P.26 | Orderliness | 36,60 |
| 50. P.37 | Trusted with breakables | 36 |
| 51. P.38 | Resists suggestion | 48,60 |
| 52. P.39 | Crosses street alone | 36 |
| 53. P.40 | Plays peek-a-boo, pat-a-cake | 9 |
| 54. P.41 | Puts cube in cup | 12,18 |
| 55. P.44 | Listens to stories | 36 |
| 56. P.45 | Plays imitatively | 24,36 |
| 57. P.46 | Draws a man | 48 |
| 58. P.52 | Part of alphabet rhymes | 36 |
| 59. P.53 | Tells name | 24 |
| 60. P.56 | Color Names | 24,36 |
| 61. L. 32 | Descriptive words | 36 |

The results of the following items varying from Gesell's ratings but only by one score.

| Number of Tests | Item | Age in Months at which each was used. |
|---|---|---|
| 1. M 26 | Walks with help | 12 |
| 2. M 40 | Spontaneous scribbling | 18 |
| 3. L 21 | Points to pictures | 24 |
| 4. L 32 | Descriptive words | 48 |
| 5. L 34 | Interprets humor | 60 |
| 6. L 44 | Repeats five digits | 48 |

| Number of tests | Item | Age in Months at which each was used. |
|---|---|---|
| 7. A 16 | Reaches for spoon | 6 |
| | string | 12 |
| 8. A 18 | Purposeful reaction to paper | 6,9 |
| 9. A 44 | Comprehension of questions - street | 48 |
| 10. A 54 | Aesthetic Comparison | 48 |
| 11. A 55 | Comparison of weights | 56 |

It could be expected that a large number of tests would vary in results from Gesell's because of the small number of cases observed at each age level. One child scoring a success or failure would make a difference of from 33% in the six months group to 11% in the two year group.

# CHAPTER X

## RETESTS

It was planned reobserve a number of children after a period of three or four months to determine whether, in a short period, growth in behavior can be noticed. On account of many of the children not returning to the Edmonton Creche the second observation could be made in only the following thirteen cases.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Case D.I. | Observed at | 4 | and | 6 | months. |
| 2. | Case 6.1 S.R. | " | " | 6 | " | 9 | " |
| 3. | Case 12.1 M.C. | " | " | 14 | " | 17 | " |
| 4. | Case 12.7 R.M. | " | " | 12 | " | 15 | " |
| 5. | Case 12.2 J.J. | " | " | 15 | " | 18 | " |
| 6. | Case 18.3 M.C. | " | " | 21 | " | 24 | " |
| 7. | Case 2.5 C.T. | " | " | 25 | " | 29 | " |
| 8. | Case 3.3 P.B. | " | " | 35 | " | 39 | " |
| 9. | Case 3.6 L.S. | " | " | 42 | " | 47 | " |
| 10. | Case 4.2 D.D. | " | " | 48 | " | 52 | " |
| 11. | Case 4.5 P.H. | " | " | 51 | " | 55 | " |
| 12. | Case 4.6 P.C. | " | " | 54 | " | 58 | " |
| 13. | Case 5.4 L.P. | " | " | 57 | " | 60 | " |

Examining some of the children twice with an interval of two to four months between served to emphasize the very rapid mental growth that occurs during the early part of the pre-school period. Considerable development was noticed in four and six months children who were seen again at six and nine months respectively, whereas, the children of four and five showed only very slight progress.

Case D.I. who was reobserved after a two month interval and case 6.1 - S.R. after a period of three months have already been mentioned and their progress discussed in detail. (1) The first set of responses which they made is recorded on the

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(1) See Chapter V

four and six months schedules respectively. The second set is recorded on the six and nine months schedules respectively, under cases 6.3 - D.I. and 9.6 - S.R. It is sufficient to state that these two infants showed rapid growth in every field of behavior in a two and three months period.

Three children who had been rated on the twelve months schedule were seen again after a period of three to three-and-one-half months. The second time they all scored successfully on a few items which they had previously failed. The successful responses of the reobserved indicated some progress in mental growth. Development in the field of language and motor behavior was noticed in cases 12.1 - M.C. and 12.7 R.W. Case 12.3 - J.J. showed slight signs of increased motor ability. Because he is noticeably defective, as rapid progress could not be expected as in the other two children.

One child examined on the eighteen months schedule was seen again after an interval of three months. She had made considerable progress in language during this period. One would expect that there would be greater development in the field of language than in any other type of behavior as it is between eighteen and twenty-four months that children learn to talk. In this particular case three months was certainly a long enough period to observe the growth that was taking place.

On the two year schedule only one child was seen the second time. The interval was four months. Here again, greater improvement in the field of language was noticed than in the other types of behavior. Satisfactory responses were made to

several isolated items of conduct but they did not seem to indicate any general trend in growth.

Two children who were examined on the three year schedule were observed a second time. Case 3.3 - P.B. was seen again after a period of three months; case 3.6 - L.S. after a period of five months. The former child displayed increased capacity in the drawing tests M 43, M 42, and in ability to recognize and name objects. The latter child had made progress in certain situations demanding adaptive ability and in ability to imitate drawings of circle and cross.

Three children were re-examined on the four year schedule after a period of four months. At this age, four months did not appear to be a sufficiently long period to notice any appreciable development in behavior. A few tests on which the children had failed the first time were passed the second time, but not more than one or two items in each field. Case 4.5 - F.H. appeared to have progressed in imitative behavior. This was the only trend noticed.

A similar situation was found at the five year level. One case was reobserved after four months. While a few items were responded to the second time which were failed the first time, there was no noticeable growth in any field of behavior.

The conclusion might be drawn that in the cases observed in the present study, three to four months was a sufficiently long interval to notice appreciable growth in children under three years. Between the ages of eighteen and twenty-nine months, the most rapid development noticed in a three month interval seemed to be in the field of language. With

children over three years, a four months period was not long enough to observe any real advancement.

# CHAPTER XI

## CONCLUSION

In undertaking the present study the aim was fourfold. First, acquaintance with the nature of the mental development of pre-school children was desired; secondly, a knowledge of Gesell's developmental schedules, of the materials, and items which he used was sought; thirdly, it was desired to determine whether the schedules could be used by the relatively inexperienced psychologist; and fourthly, whether the results of testing a few cases would have the same general trends as those in the Gesell investigation.

Direct and systematic observation of sixty-six children of the pre-school age over a period of five months has resulted in a much better understanding by the writer of the mental development which takes place. Moreover, it has allowed for the formulation of certain standards of behavior which the average child can be expected to possess at each age level.

The items which Gesell outlines are fairly simple and easy to understand. The materials and apparatus are not complicated. Occasionally, it was wished that there had been more explicit directions, or that the scoring had been more objective, but, on the whole these difficulties were not encountered.

There were too few cases observed and the group was too highly selected to state definitely that certain trends were found which varied from those outlined by Gesell. Several tendencies were noted which were not verified by Gesell's ratings. These have been discussed in Chapter IX. They seem to be explainable chiefly on the grounds of environment.

The problem of whether or not the schedules can be used by the relatively inexperienced psychologist still remains to be answered. The schedules were found to be a most helpful guide in studying the mental development of pre-school children. They marked out at every age level the fields of behavior to be observed. A number of items bringing out developments in each field are listed. It did not take long to become fairly well acquainted with the items and the directions concerning them. Thus, after a few children had been observed, the examiner could give less attention to the actual technique of testing and more attention to the responses of the child. From this viewpoint, the schedules can, not only, be used, but are of great value and assistance to the relatively inexperienced psychologist. He will become familiar with the developmental picture, and he will be able to formulate standards of behavior which the average child possesses at the various age levels.

Gesell, however, in outlining the schedules, had in mind that they should be used for something more than studying the development which takes place during the pre-school period. The greater value lies in the fact that they are a practical guide in judging and predicting the child's mental ability particularly in cases of adoption and child placement. Diagnosis and prediction require that not only shall responses to certain situations be observed and judged, but that the total behavior pattern be pictured and evaluated in terms of the maximum or minimum mental development that will take place in the future. This in turn requires abundant experience which will allow for the formulation of general standards of behavior.

The relatively inexperienced psychologist can hardly be justified in using the schedules for such purposes. The results of his decisions are too great and far reaching.

However, even though the writer lacked clinical experience, she felt that after observing sixty-six children she could undoubtedly classify certain cases as dull and some as above average using Gesell's schedules as standards.

The following children were judged to be above average:

1. Four months level - case

   D.L. (1)

2. Six months level - cases

   6.1 - S.R. (2)
   6.2 - D.C.
   6.3 - D.L. (1)

3. Nine months level - case

   9.6. S.R. (2)

4. Four years - cases

   4.3 - D.D.
   4.8 - A.B.

The following were found to be below average:

1. Twelve Months level - cases

   12.1 - M.C.
   12.3 - J.J. (3)
   12.5 - J.W.
   12.6 - H.Z.

2. Eighteen Months level - cases

   18.1 - G.S.
   18.2 - A.J.
   18.5 - J.J. (3)

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(1) Same child
(2) Same child
(3) Same child

3. Two year level - cases

2.3 - M.M.
2.8 - R.

4. Three Year level - cases

3.1 - B.S.
3.5 - F.S.
3.9 - H.J.

5. Four year level - case

4.4 - T.L.

6. Five year level - case

5.7 - M.C.

There were certain unavoidable limitations in the procedure used in this investigation. These have been mentioned heretofore, but it might be advisable to summarize them.

(a) The number of cases was too small.

(b) The group was highly selective.

(c) A number of the children were observed at too long an interval after the specific age.

(d) More information would have been obtained if the mothers could have been interviewed.

(e) The form board tests were not valid as the Gesell form board was not available.

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